

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—January, 1895.

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MINUTES OF MEETINGS.

(Abstract of such as may be of general interest to Members.)

OF THE SOCIETY.

JANUARY 2d, 1895.—The Society met at 20 o'clock, Director Foster Crowell in the chair; F. Collingwood, Secretary; and present, also, 69 Members and 7 visitors.

Ballots were canvassed, and the following candidates were declared elected. As Members: Charles Miller Morse, Buffalo, N. Y.; Masayuki Otawaga, Shimotsuke, Japan; Henry Sewell Prichard, Trenton, N. J.; Joseph Ruggles Worcester, Boston, Mass. As Associate Members: Hiram Ellsworth Baldwin, Cleveland, O.; Edwin Dwight Graves, New York City; Edward Gray, Jr., Springfield, O.

Announcement was made of the following deaths: Augustus William Boeke, elected Member September 3d, 1890; died October 24th, 1894. Joseph P. Card, elected Associate September 5th, 1883; died October 22d, 1894. Jacob M. Clark, elected Member January 29th, 1868; died December 21st, 1894.

A paper by Hunter McDonald, M. Am. Soc. C. E., on "The Bridge Over the Tennessee River at Jacksonville, Tenn.," was read by the Secretary, and discussed by Messrs. Waite, Macdonald, SooySmith, R. S. Buck, L. L. Buck, T. C. Clarke, Brinckerhoff and O'Rourke.

The discussion on the paper by Guy B. Waite, Assoc. M. Am. Soc. C. E., which was read at the meeting December 19th, 1894, on "Wind

Bracing in High Buildings," was resumed, and was taken part in by Messrs. Leverich, Collingwood, Brinckerhoff, Waite, Clarke, and Skinner.

ANNUAL MEETING, JANUARY 16TH, 1895.

Meeting called
to order.

MORNING SESSION.—The meeting was called to order at 10 o'clock by the President, Colonel William P. Craighill.

The PRESIDENT.—Before proceeding with business, there are one or two notices which should be given out.

(Read a request from the Annual Meeting Committee that Members at once secure tickets for the reception in the evening and for the excursion on Thursday.)

The SECRETARY.—I will read the following letter:

CHARLES WARREN HUNT,

Chairman Committee:

NEW YORK, January 14th, 1895.

Dear Sir,—A cordial invitation is extended to all members of the Society and their friends, to visit McComb's Dam Bridge Friday morning, and inspect the working of the draw span.

Members can take Sixth or Ninth Avenue Elevated trains to 155th Street station, ascend viaduct, and be met at the Bridge any hour of the morning.

Yours very truly,

HERBERT STEWARD,

Assoc. Am. Soc. C. E.

The PRESIDENT.—Before proceeding further I will invite any Past Presidents who may be present to take seats on the platform.

The ballot for officers of the Society will close at 12 o'clock; all those present who have not voted and wish to vote have the opportunity to do so before that hour; the polls will be closed at 12 o'clock.

The Tellers who will superintend the counting of the ballot for officers of the Society are Messrs. Gouverneur Morris, Max. E. Schmidt and Benjamin Reece.

Before proceeding with the business of the meeting I will make an announcement of the programme which has been prepared by the Committee of Arrangements for our instruction and entertainment during this Annual Meeting. While the programme will not be read in full, I will request the Secretary to read the main points, so that they may be understood.

Programme
read.

The SECRETARY.—At the morning session the annual reports will be read; reports of special committees presented and discussed; officers elected; time and place for the next Annual Convention considered. At 1.30 p. m. lunch will be served in the House of the Society, after which an afternoon session will be held, in case the business of the meeting is not finished. In the evening a reception and conversazione will be held at the Waldorf. Dancing to begin at

10.30 P. M. Supper to be served at 12.30. Evening dress will not necessarily be expected for this reception.

On Thursday morning the steamer *Sam Sloan* will leave Pier 13, foot of Cortlandt Street, N. R., at 11 o'clock, sharp, and proceed to Willets Point, where, by invitation of Lient.-Colonel W. R. King, Corps of Engineers, U. S. A., an examination of the various buildings of the Post will be made, and an exhibition of the 15-in. gun electro-magnet and of torpedo explosions will be witnessed. Luncheon will be served on board the boat.

At 8 P. M. a lecture will be delivered in this building by Dr. Charles E. Emery, M. Am. Soc. C. E., on "The Utilization of the Forces of Nature." This lecture will be illustrated by the stereopticon. Copies of the programme can be obtained at the door.

The PRESIDENT.—The first business in order is the reading of the reports. The report of the Board of Direction will now be read by the Secretary. (The Secretary read the report of the Board of Direction, which will be found on page 42.)

Report of
Board of Direc-
tion.

You have heard the report of the Board of Direction, gentlemen. It is for you to say whether you will now have read the appendices to that report.

Mr. ROBERT CARTWRIGHT.—I move that the reading of the appendices, which would take a great deal of time, be omitted; we have the printed copies here before us.

Mr. DESMOND FITZGERALD.—I suggest that the balances might be read.

The PRESIDENT.—In the Treasurer's report?

Mr. FITZGERALD.—Yes, sir.

(The Secretary read from the Treasurer's report, which will be found in full on page 47.)

The PRESIDENT.—Is there anything further that any Member would like to have read? If not, the whole report is before the Society for such action as may be desired. I suggest, however, before going to a vote, that the report of the Finance Committee be read; it is but a few lines and is a matter of a great deal of interest. (The Secretary read the report of the Finance Committee, which will be found on page 53.)

What action shall now be taken on the report of the Board?

A MEMBER.—I move the acceptance of the report. (Motion seconded; question put, and carried.)

The PRESIDENT.—As I see several Past Presidents on the floor, I will repeat I should be very glad if they will take seats on the platform.

The next business before the Society is the report of the Committee to Award the Norman Medal. Is Professor Swain present? Is any member of the Committee present? If not, we will pass on to the next business, which is the report of the Committee to Award the Rowland Prize. Mr. Cartwright.

Rowland Prize Report. (Mr. Cartwright read the report of the award of the Rowland Prize, which will be found on page 67.)

The PRESIDENT.—You have heard the report of the Committee; what action shall be taken upon it?

A MEMBER.—I move it be accepted. (Carried.)

Time and place for Convention. The PRESIDENT.—The next business is the report on time and place for holding the next Annual Convention.

The SECRETARY.—A canvass of all the votes received results as follows:

Boston, Mass., 33; Chicago, Ill., 24; New York City, N. Y., 19; San Francisco, Cal., 16; St. Louis, Mo., 15; Washington, D. C., 9; Saratoga, N. Y., 9; Philadelphia, Pa., 8; Cleveland, O., 7; Pittsburg, Pa.; Detroit, Mich.; Duluth, Minn.; Montreal, Can.; each 6. Baltimore, Md.; Denver, Colo.; Niagara Falls, N. Y.; each 5. White Sulphur Springs, Va.; Newport, R. I.; Mackinaw Island; Bar Harbor, Me.; New Orleans, La.; each 4. Colorado Springs, Colo.; Minneapolis, Minn.; Cincinnati, O.; Helena, Mont.; each 2. Halifax, N. S.; Birmingham, Ala.; Portland, Me.; Portland, Ore.; Mexico; Quebec, Ont.; Alexandria Bay; Atlantic City, N. J.; Seattle, Wash.; Sault Ste. Marie, Mich.; St. Paul, Minn.; Old Orchard Beach, Me.; each 2. The following places received one vote each: Charleston, S. C.; Milwaukee, Wis.; Mt. Desert, Me.; Bethlehem, Pa.; Glen Summit, Pa.; Trenton Falls, N. Y.; Richfield Springs, N. Y.; New Haven, Conn.; Cresson, Pa.; Salt Lake City, Utah; Lake George, N. Y.; Kansas City, Mo.; Scranton, Pa.; Louisville, Ky.; Syracuse, N. Y.; Burlington, Vt.; Providence, R. I.; Watch Hill, R. I.; White Mountains, N. H.; Rapid City, Dak.; Lake Mohunk, N. Y.; Roanoke, Va.; Cape May, N. J.; Chautauqua Lake, N. Y.; Catskill Mountains, N. Y., and China.

Mr. A. P. BOLLER.—I move the whole matter of time and place for the next Convention be referred to the incoming Board of Direction.

Mr. CLEMENS HERSCHEL.—I second the motion.

The PRESIDENT.—Gentlemen, you have heard the list of the great number and variety of places which have been proposed for the next Annual Convention.

Mr. T. GUILFORD SMITH.—Before the motion is put, Mr. President, I recall with great distinctness how your own remarks induced us to go to Old Point Comfort. Perhaps there is some advocate here of some special point, and the Board would like to have the arguments in favor of any particular place that has been mentioned.

The PRESIDENT.—I regret to say that there is a motion before the house, and I feel it is my duty to put it.

It has been moved and seconded that the whole matter of time and place of the next Annual Convention be referred to the incoming Board of Direction.

Mr. T. C. CLARKE.—I understood the mover of that motion requests

that it be referred to the incoming Board for decision. Does that mean with power? I would like to know if that was intended.

Mr. BOLLER.—It was intended that the Board of Direction, in the maturity of their judgment, select the place. That was my intention.

The PRESIDENT.—Are there any remarks on the subject?

Mr. CLARKE.—Should that not be expressed in the motion?

The PRESIDENT.—That, as I understand, is the wording now adopted by the mover of the resolution, that the matter be referred to the incoming Board with power. (Question put and carried.)

The next business before the Society is the report of the Committee on Amendments to the Constitution, which, as we all understand, is a very important matter, and I will say, in justice to the Committee who have had the matter in charge, that they have given a great deal of care and study and deliberation to the subject. We have a report which will be exceedingly interesting, and I hope it will receive the careful attention and consideration of every member. Mr. Whinery, who is present, will please come to the front and read the report.

Mr. SAMUEL WHINERY.—It is proper to say that this morning I have received from the other member of the Committee a letter in which he declines, for reasons he gives, to sign the report.

Now, I may be excused, perhaps, for referring in a very brief way to the constitutional provision in relation to the treatment of this report and the amendments offered by the Committee. The provision reads as follows:

“If, after discussion of a proposed amendment at either of the general meetings of the Society, the meeting shall so decide by a majority vote, it may refer the amendment to a committee for further consideration, which committee shall report at the next general meeting, whereupon the amendment shall be voted upon as hereinbefore provided.”

In other words, under the Constitution this whole matter, the report and amendments offered by the Committee, is before the Annual Meeting for its consideration, discussion, and either the amendment of the amendments, their adoption, or the meeting may reject them altogether, as may seem best to it.

(Mr. Whinery read the report of the Committee as follows:)

“The Committee appointed by the President of the Society in compliance with resolutions adopted at the Business Meeting of the Annual Convention of 1894, to consider and report upon certain amendments to the Constitution, submits the following report:

The resolutions under which the Committee was authorized and appointed are as follows:

1. “Resolved, that the amendment to Section 3, Article III, of the Constitution, which reads, ‘strike out the words and the names of the references or indorsers in the fifth and sixth lines,’ be referred to a committee of seven Members, to be appointed by the President, which committee shall report at the next Annual Meeting.

Report of
Committee on
Amendments
to Constitution
presented.

Report of
Committee on
Amendments
(continued).

2. "*Resolved*, that it is the sense of this meeting that the names of endorsers or seconders (of applicants for membership) should appear on the schedules that are presented to the Society for ballot for members.

3. "*Resolved*, that the proposed amendment to Article VII, section 1, as given on pages 132 and 133 of the June *Proceedings* (except the clause relating to the Secretary), the substitute for the same offered by Mr. Morison as given on pages 135 and 136 of the June *Proceedings*, and the amendment to that permitting the geographical division of the country in the selection of officers, shall be submitted to the Committee on Amendments.

4. "*Resolved*, that in the opinion of this meeting, the Board of Direction should not be a committee for the nomination of officers.

5. "*Resolved*, that in the sense of this meeting, the general principles of the amendment presented by Mr. Morison be approved.

6. "*Resolved*, that the Committee to which have been referred the several amendments to the Constitution be authorized and directed to submit other and further amendments as may be necessary to perfect the instrument in full compliance with the views and instructions of the Society, as indicated at this meeting."

The Committee has held two meetings at the Society House in New York, and its members have further conferred freely with each other by correspondence.

At the outset of its work, the Committee encountered a question as to its authority to deal with amendments other than those specifically referred to it; and a further question whether its work should be limited to a literal compliance with the resolutions in regard to some of the proposed amendments.

The language of the resolutions would seem to clearly restrict the work of the Committee to a consideration of the amendments referred to therein, or pertinent thereto, and such other minor changes as might be necessary to make such amendments harmonize with other parts of the Constitution.

Therefore the Committee did not feel authorized to consider and report upon the many proposed amendments brought to its attention by the membership which were not germane to the subject of the amendments referred to it by the Society. Furthermore, the Committee is unanimous in the opinion that the Constitution of the Society should not be amended unless the necessity for amendment is clearly apparent and would result in improving the business methods of the Society, or in increasing its usefulness to the membership. In a society having so large a membership, scattered over a large extent of territory, it is to be expected that there will be diverse views as to the provisions of the Constitution, and the methods of procedure in transacting business. There is probably hardly a Member who could not suggest off-hand one or more changes in the Constitution that would, in his opinion, be desirable, but which, on more careful consideration

he would find unnecessary, and which other Members would think undesirable or pernicious.

Under the present Constitution the work of the Society has proceeded very smoothly; this fact, and the renewed prosperity of the Society since its adoption, leads the Committee to believe that, in the main, it fulfils its purpose admirably, and should not be lightly tampered with.

The Committee recommends certain amendments pertinent to the sections of the Constitution referred to it, which are submitted herewith :

AMENDMENTS TO THE CONSTITUTION OF THE AMERICAN SOCIETY OF CIVIL
ENGINEERS PROPOSED BY THE COMMITTEE OF SEVEN APPOINTED BY THE
PRESIDENT IN PURSUANCE OF CERTAIN RESOLUTIONS ADOPTED AT
THE BUSINESS MEETING OF THE ANNUAL CONVENTION HELD
AT NIAGARA FALLS, JUNE, 1894.

ARTICLE III.

"Sec. 3. Strike out the words 'references or endorsers' in the sixth line, and substitute the words : 'references,' in the case of Corporate Member, and 'endorsers,' in the case of Associate, Junior or Fellow. Proposed Amendment to Art. III.

"Sec. 5. Strike out all the section after the sentence, 'If the Board decides that the reasons for a reconsideration are sufficient, it shall order another ballot to be taken,' and substitute the following: 'A letter ballot, in a form to be prescribed by the Board, shall then be mailed to each Corporate Member whose address is known. Each ballot shall be signed by the Member who votes it. The returns shall be canvassed by the Board, at a meeting to be held not less than 20 days after the blank ballots shall have been mailed by the Secretary.

"Negative votes to the number of 10 per cent. of those cast shall exclude. In case of exclusion, no notice thereof shall be entered in the minutes, but the candidate shall be notified.

"The request for reconsideration of a ballot must be presented within one year after the date of the original canvass of such ballot."

ARTICLE VII.

Strike out the whole of the present article and substitute the following : Proposed Amendment to Art. VII.

"Sec. 1. The Board of Direction shall, from time to time, divide the territory occupied by the membership into seven geographical districts, to be designated by numbers. District No. 1 shall be the territory within 50 miles of the Post Office in the city of New York. Each of the other six districts shall be, as nearly as practicable, contiguous territory ; each shall contain, as nearly as practicable, an equal number of members, and they shall be designated as Districts No. 2, 3, 4, 5, 6 and 7. The Board shall announce such division to the Society on or before the first day of May in each year.

"Sec. 2. At the Business Meeting of the Annual Convention of each year, seven Corporate Members, not officers of the Society, one from each of the geographical districts, shall be appointed by the meeting

Proposed
Amendment
to Art. VII
(continued).

to serve for two years ; who, with the five living last Past Presidents of the Society, shall be a committee to nominate officers for the Society. The Board of Direction may prescribe the mode of procedure for appointing this committee. This committee shall present to the Board of Direction, on or before the first day of October next ensuing, a list of nominees for the offices to be filled at the next Annual Election. The nominees shall be so chosen as to provide, with the officers holding over, a Vice-President and six Directors residing in District No. 1, and 12 Directors divided equally, with regard to number and residence, among the remaining districts, Nos. 2, 3, 4, 5, 6 and 7.

"Sec. 3. Directly after the first of October the aforesaid list of nominees shall be mailed to every Corporate Member whose address is known, provided that if any person shall be found by the Board of Direction to be ineligible for the office for which he is nominated, or should a nominee decline such nomination, his name shall not be sent out, but the Board shall substitute another name therefor. The Board shall also fill any vacancies that may occur in this list of nominees up to the time the ballots are sent out. Vacancies must be so filled as to preserve the geographical distribution of officers prescribed in Section 2 of this article.

"Sec. 4. At any time before the first day of December, any 10 or more Corporate Members may send to the Secretary additional nominations, signed by such members ; but nominations so made must comply with Section 2 of this article, regarding the distribution of nominees among the several districts.

"Sec. 5. At least 30 days before the Annual Meeting, there shall be mailed to every Corporate Member whose address is known a letter-ballot with envelopes for voting. This ballot shall include all the nominations made in accordance with this article. The names and residences of the nominees, their grades of membership, and, in the case of nominees for Directors, the number of the district in which they reside, shall be given. The names of the nominees for any one office shall be arranged alphabetically without distinguishing marks of any kind other than the designations named herein.

"Voters may erase names from the printed ballot-list and may substitute the name or names of any other person or persons eligible for any office. But the number of names for each office on the ballot voted must not exceed the number to be elected at that time to such office, and the vote must be for the proper number of officers resident in each of the seven districts. Ballots not complying with these provisions shall be rejected.

"Directions in accordance with these provisions shall be issued with the ballots.

"Sec. 6. Ballots may be sent by mail to the Secretary, or may be presented to him at the Society House. They must be enclosed in two sealed envelopes, and the outer envelope shall be endorsed by the voter's signature.

"The Secretary shall make from the signatures on the outer envelopes a list of the voters from whom ballots are received, which list shall be open to inspection by all Corporate Members. A voter may withdraw his ballot, and may substitute another, at any time before the polls close.

"Sec. 7. The polls shall be closed at 12 o'clock noon on the first day of the Annual Meeting, and the ballots shall be canvassed publicly by tellers, who shall be appointed by the presiding officer.

"The persons of each district, who shall receive the highest number

of votes for the office for which they are candidates shall be declared elected.

"In case of a tie between two or more candidates for the same office, the Annual Meeting shall elect the officer from among the candidates so tied.

"The presiding officer shall announce to the meeting the names of the officers elected, in accordance with this section."

It is proper that the Committee should refer to these amendments in detail, and state briefly the reasons for its action.

Report of
Committee on
Amendments
(continued).

Art. III, Sec. 3. There seems to exist in the minds of many some confusion as to the terms "references" and "endorsers," as used in this section, and it is thought advisable to so change the wording of the section as to make the use of the words clear. Resolution No. 2, adopted at the Annual Convention and quoted above, states that "It is the sense of this meeting that the names of the endorsers, or seconders, should appear on the schedules that are presented to the Society for ballot for Members"; but it appears from the proceedings of the meeting that the motion as offered and seconded read:

"That it is the sense of this meeting that whatever amendment is proposed or arranged by this Committee, it shall contain some provision under which, either in the Blue List or letter-ballot, the names of the endorsers shall appear."

Inasmuch as the Constitution as it now stands provides for the publication of the names of references and endorsers in the preliminary, or Blue List, and as the form of the letter-ballot and the matter that shall appear on it is discretionary with the Board of Direction, there seems to be no necessity for further amendment covering this point.

Art. III, Sec. 5. The only important change recommended in this section is the requirement that ballots on reconsideration of rejected applications for membership must be signed by voters.

The fact that worthy engineers have been kept out of the Society by the votes of a few members actuated by personal and unworthy considerations is known and deeply regretted by all who have the welfare of the Society at heart. While it is of the greatest importance that every proper precaution should be taken to prevent the admission of unworthy persons, and while as a means to this end the secret ballot has much to recommend it, there can be no doubt that it may be, and in not a few cases has been, abused, to the detriment and discredit of the Society.

There has never been a time in the history of the Society when the character and standing, both personal and professional, of applicants was so carefully and rigidly investigated by the Board of Direction as now, and there is good reason to believe that there will be no relaxation in this regard in the future. Every Member of every grade is offered ample opportunity, through the Blue-List notices, to make known to

Report of
Committee on
Amendments
(continued).

the Board of Direction any facts or reasons within his knowledge affecting the character and professional standing of every applicant.

If the applicant is rejected upon the first ballot, and a request for a reconsideration is made, every member is again notified and asked to communicate to the Board any facts or evidence for or against the applicant. Each Member is thus given a second opportunity to be heard if application is made for a reconsideration, and there is no record that the Board has ever failed to reject an application where satisfactory evidence has been offered that the applicant was unworthy.

It seems to the Committee that in the case of the second ballot, after the Board has, in the light of all the facts obtainable, twice investigated the character and professional standing of an applicant, and decided that there is no substantial reason for rejection, it is desirable that the secret ballot should be dispensed with. The Society cannot afford to be placed in the light of providing, through a secret ballot, the protection from behind which members actuated by unworthy motives may pursue the method of warfare commonly known as "bushwacking," and condemned by all civilized people.

There will, of course, be honest differences of opinion as to whether an applicant is entitled to membership in the Society, and the right to vote against admission should not be abridged; but it is believed that members who are actuated by proper and worthy motives will not object, when voting on this second ballot, to placing themselves on record by signing their ballot.

ART. VII. The Committee has regarded the subject of the nomination of officers for the Society as the most important matter referred to it, and has given to it the most careful consideration.

The first question considered was whether, under Resolution 5, adopted at the Annual Convention in 1894, and quoted above, the Committee should restrict its action to the plan of making nominations referred to therein. Inasmuch as the Member who offered this resolution stated to the meeting before the vote upon it was taken that it was not intended to restrict the action of the Committee, but only to express the view of those present at that meeting, the Committee felt authorized to consider other plans for nominating officers, and to report to the Society that plan which, in view of all the conditions to be met, seemed likely to prove most satisfactory in use. Therefore a number of plans proposed by members of the Society, including the three brought to the attention of the Annual Convention of 1894, were carefully considered. The plan which the Committee recommends to the Society differs from that now in use in the following particulars:

First.—It makes the division of the territory occupied by the membership into seven geographical districts a constitutional provision,

and divides the non-resident members of the Board of Direction equally among the six non-resident districts.

Second.—It increases the number of elective members of the Nominating Committee from seven to fourteen, and makes the term of service two years, seven members being elected each year.

Third.—It empowers the Board of Direction to prescribe the mode of procedure in the election of members of the Nominating Committee.

The considerations that have influenced the Committee in its action on this subject may be briefly stated as follows :

1st. The most serious obstacle to the satisfactory working of any plan for nominating officers is the fact that the Members of the Society do not take an active interest in the matter. This is shown by the fact that letters sent out by the Secretary, or by nominating committees, asking for suggestions relating to nominations are answered by a very small percentage of the membership. This fact has largely influenced the Committee against any plan of making nominations dependent for its initiation or carrying out on replies by mail to circular letters; and while such circulars and replies are of value as auxiliaries, it would be unwise to limit the method of nominating officers to such a plan.

2d. The Committee believes that nominations for officers should be made by the direct representatives of the membership at large. This accords with the spirit of American institutions, and places the responsibility for the government of the Society directly in the hands of the membership.

3d. For the same reason, the Nominating Committee should be appointed at the Annual Convention, which is more representative in character than the annual or any other meeting of the Society.

The holding of the convention in a different locality each year, and the large number of members usually in attendance, brings the membership closely in touch with the government of the Society and affords the only opportunity that many of them have of taking part personally in the management of the Society's affairs.

4th. The provision that each of the six non-resident districts shall be represented by two Directors resident in that district will, in addition to securing a satisfactory geographical distribution of the Board of Direction, tend, we believe, to greatly increase the interest of the membership in the nomination and election of officers of the Society. It will bring the matter nearer home to every Member, and will enable him to assist in selecting at least two of the Directors from among those with whom he is likely to be best acquainted, either personally, or by reputation. This provision does not change the number of members of the Board, nor alter the number or status of Resident Directors.

5th. It is desirable that the Nominating Committee should be large

Report of
Committee on
Amendments
(continued).

enough so that its meetings will likely be attended by a considerable number of Members, as its action is likely to be more representative and satisfactory than when only a few attend and make the nominations. The amendments now offered provide for a committee of 14, appointed by the Convention, and the five living last Past Presidents of the Society, 19 in all.

6th. It is thought desirable that the members of the Nominating Committee should serve more than one year. As officers of the Society cannot serve on the Committee, it will often happen that Members appointed on this Committee will have had neither much experience in the affairs of the Society, nor a large acquaintance with its Members, and they will feel at a loss to act intelligently. The experience they will gain in the first year's service will be of value, both to themselves and to the Society, in making the nominations for the succeeding year. On the other hand, the term of service should be short enough to insure that the Nominating Committee will remain in close touch with the popular element in the Society. The Committee has designated two years as the term of service.

7th. It is hardly usual, nor would it be wise, in the opinion of the Committee, to prescribe in the Constitution full details for the appointment of the Nominating Committee. If, through change of conditions, or of opinion among the membership, it should become desirable to alter such details, it could only be done by amending the Constitution. It is therefore thought best to leave the details of the manner of procedure in electing the Nominating Committee to the Board of Direction.

While the Committee does not presume to advise the Board of Direction in reference to such details, it may not be improper to express the conviction of its members, that the present mode of procedure in the appointment of the Nominating Committee is, with some slight modifications, as satisfactory as any plan that has been brought to its attention, and the Committee would recommend its further trial. What seems unsatisfactory in the working out of the plans is largely attributable to the failure of the members to acquaint themselves with its details, and to interest themselves in the matter.

All of which is respectfully submitted.

[Signed]

CLEMENS HERSCHEL,
BERNARD R. GREEN,
WILLIAM H. BIXBY,
JOHN THOMSON,
WILLIAM METCALF,
S. WHINERY, *Chairman*.

The PRESIDENT.—Gentlemen, you have heard the report of the Committee. If the chairman of the Committee does not wish to make any further remarks at this time, the subject is now open for discussion.

Mr. FOSTER CROWELL.—Mr. President, there is one point in regard to the suggestions of the Committee which, to my mind, is not clear, and I want, in making an objection to that point, to ask for further information from the Committee. What will be the effect of Members signing their names to the adverse second ballots, which we call the pink ballot? What record of those signatures will be made? As at present, neither of the ballots is made a matter of record, except in the aggregate. It seems to me that while there is often some good reason for a Member voting for the second time an adverse ballot, yet what is the substantial effect of his putting his name to it? It seems to me there is no effect whatever. On the other hand, if the ballot remains as it is now, the effect is precisely what it would be if the signature were attached to the adverse ballots. I would like to ask the committee what would be the practical effect of those signatures?

Amendment to
Art. III, Sec. 5,
discussed.

Mr. WHINERY.—In reply to Mr. Crowell I would say this: While these amendments do not distinctly state what action shall be taken by the Board of Direction in reference to the signed ballots, they do state distinctly that "in case of exclusion no notice thereof shall be entered in the minutes, but the candidate shall be notified." The whole care of the ballots, how they shall be disposed of, remains with the Board of Direction, and I have no doubt that they will make discreet use of them.

The argument in favor of this amendment may be further supplemented in this way: In a society of this size there always will be admitted, no matter what precautions may be taken, some members who are subject to human passions and weaknesses. There are few of us who have not made personal enemies; some of these enemies are willing to stab us, provided they can do so in the dark. The chances are that if they were required to come out boldly and sign their names, they would consider the subject much more carefully than if they were able to stab an applicant, as it were, in the dark.

The PRESIDENT.—Before this discussion proceeds farther I think it proper to state that the business of the meeting will be facilitated if we take up these amendments in the order in which they are printed. By reference to the printed paper which is before us, the first subject for consideration is the amendment proposed to Article III, Section 3, which I will read in order that it may be distinctly before the Society:

Amendment to
Art. III, Sec. 3,
discussed.

"Article III, Sec. 3. Strike out the words 'references or endorsers' in the sixth line, and substitute the words: 'references,' in the case of Corporate Member, and 'endorsers,' in the case of Associate, Junior or Fellow."

I will request any one who wishes to speak now to speak to this section first.

Mr. J. M. KNAP.—I move its adoption.

Past President MENDES COHEN.—Mr. President, I would like to say a word before action is taken on this motion.

Discussion on
Amendment to
Art. III, Sec. 3
(continued).

If the ballot is to go out to the Members without any presentation of the names of those who have recommended, or approved of, the nomination of the candidate, the membership is voting simply and entirely on their faith in the action of their Board of Direction, which is all right. It would be all right, at least, if it were not that a very large proportion of the membership, as we have seen by actual practice in the past, ignores the whole thing and there comes in but a ballot of 200 or 250 names. There can be, in my judgment, no objection to the names of the endorsers going out, and when we see the name of an entire stranger on the ballot list, we will know that that man not only has passed the examination of the Board of Direction, but that the Messrs. A. B., C. and D., whose names we find there, and whom we know to be men of standing, endorse him, and we will be much more apt to attend to the matter and to vote. The only object in withholding those names is to save occasionally a man who has not felt that he could conscientiously endorse the candidate from intimating as much by the non-appearance of his name. I am inclined to think that a man who feels that way owes enough to the Society not to stand in fear of that knowledge getting out. I think it will be infinitely better when the names of the candidates go out, if the names of those men who endorse the candidate go with them, notwithstanding the fact that the parties may be informed thereof by the Blue List.

MR. CLEMENS HERSCHEL.—I would like to ask what substitute in place of the amendment that has been recommended does the gentleman propose?

THE PRESIDENT.—Does Mr. Cohen propose any amendment?

MR. COHEN.—I would propose to insert the names of the endorsers, the names of the referees, rather, the word "endorsers" not applying there. I would propose to insert the names of the referees.

THE PRESIDENT.—Will you please read the amendment that you propose, so that it may be distinctly understood?

MR. DESMOND FITZGERALD.—Mr. President, will you please read these two or three lines? I would like to know, in casting my vote, what is the intention of the Committee? "Which list shall contain a concise statement of the record of each applicant and the names of the 'references' in the case of Corporate Member, and 'endorsers' in the case of Associate, Junior or Fellow." As I understand, that is the proposed amendment that is offered by the Committee.

THE PRESIDENT.—Is that an amendment that you propose?

MR. FITZGERALD.—No, sir; that is the one we are considering—Article III, Sec. 3.

MR. BERNARD R. GREEN.—It seems to me, Mr. President, that the Constitution has already been amended in this matter by the votes of the Society last fall. It is found in the new section of Article III, which provides for the furnishing of names of endorsers in case of ap-

plicants. This amendment proposed by the Committee is only an explanation or amplification of the language in regard to the definition of endorsers and references, so that, in the minds of the Members of the Society, the words may not be confused.

The PRESIDENT.—As I understand the matter before the Society just now, it is as Mr. Green has stated. This is not an amendment to change the spirit of the Constitution, but simply to make it plainer.

Mr. WHINERY.—I may say in reference to that, under the old Constitution all applicants for membership in every grade were endorsed; that is, the applicant must secure the names of five endorsers. When the Constitution was revised it was thought, for reasons that I need not detail here, that it would be better to ask that each applicant should give five references, give the names of five Corporate Members with whom he is acquainted, and with whom the Secretary might correspond with regard to the fitness of the applicant for membership in the Society. It was thought that in that way we would be very much more likely to get an unbiased opinion from those people than if they had previously endorsed the application for membership. Under the new Constitution, the applicant for Corporate Membership is required to name five Corporate Members with whom he is personally acquainted, but in case of Juniors, Associates and Fellows, that was not thought to be necessary, and the old method, practically, of requiring endorsers for those classes was adopted. Now, the language in the Constitution was not quite as clear as it might be in reference to this, and Members confused the terms used with the old method of signing or endorsing applications to membership. The wording here is changed so that the meaning may be obvious; the meaning is not changed.

Mr. COHEN.—Mr. President, under the explanation which has been made by the chairman of the Committee, I have no amendment to make to the amendment as offered.

The PRESIDENT.—Does any gentleman wish to make further remarks on this amendment?

Mr. THEODORE COOPER.—I believe, Mr. President, it is customary to recommend these amendments for adoption. I move that this amendment to Article III, Section 3, be recommended to the Society for adoption. (Seconded.)

The PRESIDENT.—It is moved and seconded that this meeting recommend for adoption the following amendment to the Constitution:

“Strike out the words ‘references or endorsers’ in the sixth line, and substitute the words: ‘references,’ in the case of Corporate Mem-
ber, and ‘endorsers,’ in the case of Associate, Junior or Fellow.”

Amendment to
Art. III, Sec. 3,
recommended
for adoption.

(Question put and carried.)

The next business is the consideration of the proposed amendment to Section 5 of Article III, which I will read:

Amendment to
Art. III, Sec. 5,
discussed.

"Strike out all the section after the sentence, 'If the Board decides that the reasons for a reconsideration are sufficient, it shall order another ballot to be taken,' and substitute the following: 'A letter ballot, in a form to be prescribed by the Board, shall then be mailed to each Corporate Member whose address is known. Each ballot shall be signed by the Member who votes it. The returns shall be canvassed by the Board, at a meeting to be held not less than 20 days after the blank ballots shall have been mailed by the Secretary.

"Negative votes to the number of 10% of those cast shall exclude. In case of exclusion no notice thereof shall be entered in the minutes, but the candidate shall be notified.

"The request for reconsideration of a ballot must be presented within one year after the date of the original canvass of such ballot."

MR. THEODORE COOPER.—Mr. President, I move the adoption of this amendment. It is not a new amendment. Some 10 years ago the Society had no remedy for the blackballing of a candidate. Some men of 30 or more years' experience, standing well before the world, have been refused admission by men stabbing in the dark. It was thought unwise, unworthy, of the Society that it should continue any such system; we had better admit one bad man than cultivate the spirit of striking in the dark. We have now, sir, a method by which, on the first vote, an unworthy man can be blackballed. The theory of this amendment is the theory of the old one; it is simply changed in the wording. That supposition is that a man who knows he is unworthy will not bring himself up to be voted on in open meeting; his friends will not allow him to do it. But a man who knows he has been unworthily rejected will have the courage to come forward and say, "I am willing to submit to an open ballot. I know there is nothing in my career to keep me out." The Board, whom we select, sir, decides that a man is worthy of election; his name goes out and his election is stopped by five black balls. Now, in reconsideration he goes back to the Board of Direction again; these five men who stopped him have another chance to go to the Board; they refuse, or if they do go, the Board does not consider their statements of sufficient strength to decline to accept the candidate. Now, I say, when a man comes up, endorsed in that way, it is cowardly to have a secret ballot; it is unworthy of us as men. If we have an objection to the candidate we ought to be manly enough, as engineers—I think the profession is a most outspoken one—we should be brave enough to say openly, "this man is not worthy of admission to the Society." I would like to mention instances, but it is not proper. But it is an open secret that a man was stopped not long ago by only a few ballots. I was personally informed by men who had opposed him on the first ballot that they would not oppose him on the second; yet on the second ballot he was opposed by two or three times as many as on the first ballot. What is the explanation of that? The explanation is, secret rumors. I met them on the street. Where they came from, nobody knew. A large number of Mem-

bers voted, as I believe, simply on that rumor; they would not have written their names on that ballot. Now, sir; I think, for the good of the Society, for the good of the Members who are now in the Society, we ought not to encourage any such unmanliness as a second secret ballot.

Mr. O. F. NICHOLS.—In seconding the motion of Mr. Cooper I would merely add this: The vote on a second ballot rarely ever exceeds 300; the 10% required by the Constitution would amount to, say, less than 30 votes. It requires seven to defeat on the first ballot, and, increasing the efforts of the opposition, a very small additional number would defeat on the second ballot. I recall an instance occurring several years ago, in which a Member had a personal spite against a candidate. Within the space of two or three days 16 votes were obtained against him. When the question was asked, "Why was not that man elected?" the answer was, "For reasons good and sufficient, there were 16 votes against him." Of course those votes only covered the five and 11 more; they would have required a very little larger increase to have come up to 10% of the total, if not to exceed it, as our pink ballots do not amount to more than 200 or 300. That brings this question to my mind, that the difference between these two ballots is not sufficiently pronounced. If it required that 20%, or 50%, of the membership should be necessary to keep out, then we would have more attention called to it, but a very small proportion of the membership is sufficient to keep a candidate out. If the membership be, in round numbers, 2 000, instead of requiring 200 votes to keep a candidate out, as a matter of actual fact, 25 or 35 votes will exclude him. I say, it is not asking too much to say that these 20 or 30 men who may vote and decide to keep this man out shall have the courage of their convictions, as we all profess to have. I don't believe that a Member of this Society, pinned right down to a vote, will be afraid to back his ballot by his name, and that is all that is required. Those ballots should be destroyed after they are counted and the result decided. There is no necessity—indeed it rarely ever would be the case—that a man who signed his name to an adverse ballot would be known to the general membership, and, least of all, outside of the Society. As in signing papers of any kind, we all of us will sign papers if it does not cost us anything, so where a man is not compelled to sign a ballot, he will say, "Oh, yes; I will vote," but if he has to sign that paper he will think a second time before he votes.

The PRESIDENT.—You have heard the motion, gentlemen, which has been seconded. Are there any further remarks?

Captain WILLIAM H. BIXBY.—When this article was up for discussion before the Committee, of course members of the Committee heard from all sides all sorts of arguments, one way and the other. As an illustration of how some Members of the Society are supposed to look

Discussion of
Amendment to
Art. III, Sec. 5
(continued).

on this question—I don't say actually, but they are supposed to look on it—one answer came in to us as follows: Somebody stated on the question of blackballing, "If any one of my friends asked me to blackball a man, I would blackball him, of course, just because he asked me." It is very natural to suppose that in any society of 1 000 members there are people who blackball just because a friend asked them to; they do not bother themselves by looking into the merits of the case. The men who blackball for a reason like that would stop and think twice over it if they had to sign their names to a ballot to go before the Board of Direction.

One of the great troubles of the Board of Direction is that the men who are going to blackball very often do not write to the Board of Direction. The Board sends out a list, asking everybody in the Society to tell them all they know about the candidates. It is very seldom that anything serious comes in. When the name of a candidate goes out for reconsideration on a second ballot, it will be very seldom, I am told, that anything serious comes in. It all appears to be held back, to be put into a vote which is not signed and which nobody knows about. Of course, I do not think the majority of the Society would do any such thing as that, but if there are a few men who do it, just think how little of such action it would take to reject; but $\frac{1}{2}\%$ of the 1 100 Members would give enough to blackball a man on the second vote, considering that it hardly ever occurs in the Society that a large proportion of the membership votes. The whole 1 100 have to bear the responsibility of what the friends of a very few Members may do. I do not think it is right. I think the whole Society ought to feel that, whether they vote or not, they are responsible for the rejection of a candidate, and when their attention is called to the first blackball by the sending out of the pink ballot, and they understand that a candidate is up for reconsideration, they should feel that to abstain from voting and to do nothing at all is not the proper course. I do not think it is right as it stands now, and I am sure if every man knew that he had to sign an adverse ballot, he would stop and think it over a good many times.

The PRESIDENT.—Are there any further remarks? (Question called for.)

A MEMBER.—Mr. President, will you please state the amendment?

Amendment to
Art. III, Sec. 5
recommended
for adoption.

The PRESIDENT.—(Read the amendment.) If there are no further remarks the question will be put, which is, that the Society at this meeting recommends this amendment for adoption. (Question put and carried.)

The next is an amendment to Article VII, which strikes out the whole of the present article and substitutes the following:

(Read the amendment, see page 7.)

If there are any remarks to be made we are now ready to hear them. Amendment to
Art. VII
discussed.
Mr. Whinery, you have the floor if you wish to make any explanation.

Mr. WHINERY.—It is probably only necessary to say, in addition to the written report of the Committee, that, as you will notice, quite a large part of this article is precisely in the same language as it is found in the revised Constitution, and to that extent no change is made; but it was thought better, rather than to make piece-meal amendments to each section, to strike out the whole and adopt an entirely new article, particularly as it was thought that the language of some parts of the article might be slightly improved.

Mr. FOSTER CROWELL.—To bring the matter before the meeting, I move that the proposed amendment to Article VII, as presented by the Committee, be recommended by the meeting for adoption. (Seconded.)

The PRESIDENT.—In order that this may be distinctly understood, I will call the attention of the meeting to the fact that this motion of Mr. Crowell's, which has been seconded, carries seven separate sections. Does any gentleman wish to make any remarks on the subject?

Mr. COHEN.—Mr. President, I only rise to emphasize what has been said by the chairman of the Committee which had this revision in charge. I wish only to urge upon the membership the importance of the adoption of this amendment. I think it is very essential. I think it will work well. There may be some of us who believe that there must be a radical change, some who recommend that the whole matter of nominations be referred to the full Board of Direction. This makes, practically, a special board for that purpose. I think it is eminently desirable that it should be adopted.

The PRESIDENT.—Are there any further remarks? If not, the question will be put.

Mr. WHINERY.—If you will allow me to suggest, this is quite an important matter and one on which I know there are various opinions among the membership. The Committee would prefer that it should be carefully considered and fully discussed before it is adopted, because, as I say, we regard it as a matter of considerable importance, and I would suggest that the fullest opportunity be given for discussion.

The PRESIDENT.—I fully agree with the chairman of the Committee. This is a very important subject, and, as far as I am concerned, I should be glad to hear the opinions of the Members.

Mr. DESMOND FITZGERALD.—It seems to me desirable that we should understand fully in regard to this. As I understand it, the amendment does not change in any way the officers, but simply the machinery by which they are elected.

Discussion of
Amendment to
Art. VII
(continued).

The PRESIDENT.—That is right; it simply changes the running of the machinery. This is simply a method for making the machinery run more smoothly.

Mr. FITZGERALD.—The Board of Direction is still the same?

Mr. WHINERY.—Perhaps I may explain briefly that this is practically the same method of nomination that has been in use by the Society heretofore; that is, the officers of the Society are nominated by a Nominating Committee. This Nominating Committee heretofore has consisted of seven members, appointed at the Annual Convention each year. Under the Constitution, the five living last Past Presidents of the Society are also members of the Committee.

The principal criticism has been, I think, that little interest has been taken by the Society in the appointment of that Committee. Of course no method will remedy that; unless the Members themselves take an interest in the question of nominations for officers, no method will secure a proper working.

In the second place, it was thought the Committee was too small, inasmuch as, the Members being appointed from all over the country, only a few of them would be in attendance at the meeting of the Committee, and consequently the nominations might be made by only two or three members of the Committee.

Another objection is that very often Members have been selected from remote regions, which was entirely proper, but by reason of their remoteness they have not been largely acquainted with the methods of doing business of the Society, or with the membership of the Society, and, meeting the Committee for the first time, they were not well prepared to make nominations intelligently. It was thought by increasing the term of service they would be better qualified, and particularly as the Committee is really a continuing one, seven of the Members being elected each year and seven holding over, which establishes a permanency and continuity of the Committee that was thought to be desirable.

Perhaps, however, the largest amount of criticism of the old method came from those who were not satisfied with the methods of choosing the Nominating Committee. This Committee is not able to determine what method of selecting the Nominating Committee at the Annual Convention would give the best results. If the Committee should consider one plan best and adopt it, and the Society should adopt it, it thereby becomes part of the Constitution. It was therefore thought best to leave the whole method of proceeding as to the appointment of this Nominating Committee to the Board of Direction.

The Committee believes, and so states in the report, that the present method, if the Members will take an interest in it, is as good as any brought to the attention of the Committee, but that might not continue to be the case, and therefore it was thought desirable to

leave the whole matter open with the Board of Direction, so that this plan may be tried a year or two, and, if it is not satisfactory, some other plan may be tried in a year or two, and we will arrive at some method which gives the best results.

The PRESIDENT.—Before proceeding with this discussion, as the hour for closing the polls is at hand, I will give notice that the polls will close in about 15 minutes, and that time still remains for those who wish to vote.

There is another notice which I will also take this occasion to read again. (Repeated notice as to tickets for the reception and excursion.)

If there are no further remarks, the question will now be put. The amendment strikes out the whole of Article VII and substitutes another, which has been read and which is in print in the hands of the Society. The motion is to recommend for adoption this new article to the Society. (Question put and carried.)

Amendment
to Art. VII
recommended
for adoption.

The PRESIDENT.—There are two other amendments to the Constitution which were proposed November 7th which are now before this meeting. Will the Secretary please read them?

(The Secretary read the two communications.)

The amendments proposed are as follows:

“Strike out Section 5 of Article VI, reading as follows: ‘An Assistant Secretary, who shall also be Librarian, shall be appointed by the Board of Direction, and shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society.’”

1st Proposed
Amendment to
Art. VI, Sec. 5.

[Signed]

A. F. BROWN.
THOS. APPLETON.
E. GERBER.
WM. METCALF.
C. L. STROBEL.
G. B. NICHOLSON.
G. BOUSCAREN.

The other reads:

“Amend Section 5 of Article VI by striking out the entire section, reading as follows: ‘An Assistant Secretary, who shall also be Librarian, shall be appointed by the Board of Direction and shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society,’ and substituting the following: ‘The Board of Direction may also, if they deem it necessary, appoint an Assistant Secretary, who shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society.’”

2d Proposed
Amendment to
Art. VI, Sec. 5.

[Signed]

ROBERT MOORE.
JULIUS BAIER.
BEN. L. CROSBY.
M. L. HOLMAN.
ROBT. E. McMATH.
W. S. LINCOLN.

Proposed
Amendment to
Art. VI, Sec. 5,
discussed.

Mr. CROWELL.—Mr. President, will you call attention to the fact that the second amendment, as it has been read, covers all of the first amendment and possesses one additional feature. I would move, therefore, that the second amendment which has been read be recommended by this meeting for adoption. (Seconded.)

The PRESIDENT.—You have heard the motion, gentlemen; are there any remarks on the subject?

A MEMBER.—Is that a new amendment?

The PRESIDENT.—Yes, sir. I will read it again. The amendment is one proposed in a constitutional way, in a letter dated from St. Louis, Mo., as follows: (Read the amendment again.)

Mr. L. L. BUCK.—Mr. President, I would like to ask what use there is in giving the Board an opportunity to elect the Secretary of the Society, and then to elect another secretary over him, or under him, just as the case may be? If the Board has control of the office of Secretary, as it does now, under the revised Constitution, what is the use of the Board's appointing an Assistant Secretary? The Secretary is held responsible for the office, and it does not make it any stronger to put another man in. I say, rather strike it out entirely.

Mr. FITZGERALD.—Is there another amendment proposed?

The PRESIDENT.—No; I understand the gentleman is advocating this amendment.

Mr. BUCK.—I am advocating the first amendment—to strike out the clause in regard to the Assistant Secretary entirely.

Mr. FITZGERALD.—That is what I understood, and that you did not approve of the second amendment.

Mr. CROWELL.—The second amendment is before the house. While it may be true, as Mr. Buck has said, that there may be no use of the appointment of an Assistant Secretary, yet we can all understand that in the future instances may arise where it would be quite desirable. The second amendment leaves this in the hands of the Board; if the Board sees no reason for the appointment of an Assistant Secretary, it need not appoint one; if the necessity does arise, it has the authority. It seems to me it is better to leave it in the discretion of the Board as is done in the second amendment.

Mr. HERSHEY.—I want to support what the last speaker has said and also to argue from this ground: That the Assistant Secretaryship seems to be a good school from which to select the secretaries. I believe a little business conservatism will do the Society no harm and stop, perhaps, some of the erratic means of which the Society has not been guiltless in the past.

Mr. WHINERY.—If this amendment is adopted, there need be no additional help, we will call it, employed by the Board of Direction. The same number of officers or assistants in the Secretary's office will doubtless be employed then, no more than, in the opinion of the Board,

is necessary to transact the business of the Society. The question is simply this: Shall the first assistant be called the Assistant Secretary, or shall he be called a clerk in the Secretary's office? The business of the Society has grown so large that it is necessary to have a first clerk, a man of more than ordinary capacity, to assist the Secretary. The question is, what shall we call that clerk? I think the laborer is worthy of his hire, and, in addition to the salary, which must be rather meagre, the title of Assistant Secretary. I can see no objection to this amendment; it does not compel the appointment of an Assistant Secretary. If the Board believes that this first clerk is worthy of the title of Assistant Secretary, it can confer it on him.

Past President G. S. GREENE.—It strikes me, Mr. President, that it is necessary that the Society should always have an official representative, and in case the Secretary is taken sick, as the Board has not the right to substitute some one in his place, if you have an Assistant Secretary, he can take the place of the Secretary.

The PRESIDENT.—If there are no further remarks the question will be put. In order that there may be no misunderstanding, I will say that heretofore, for a short time, it has been mandatory upon the Board to appoint an Assistant Secretary, an officer whose services have been found necessary. Several Members have thought fit to propose an amendment leaving the appointment optional with the Board. That is now the question before the Society. It is moved and seconded that the following amendment be recommended to the Society for adoption:

"Amend Section 5 of Article VI by striking out the entire section and substituting the following: 'The Board of Direction may also, if they deem it necessary, appoint an Assistant Secretary, who shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society.'"

2d Proposed Amendment to Art. VI, Sec. 5, recommended for adoption.

(Question put and carried.)

The PRESIDENT.—I will say that the hour of 12, which, under the Constitution, is the hour for closing the ballot for officers of the Society for the ensuing year, has now arrived; the ballot is, therefore, closed. The result of the ballot will be announced as soon as the Tellers have performed their duty. The next business before the Society is the report of the Committee on Standard Time. Mr. Fleming, the chairman of the Committee, is not present. Is any member present of the Committee on Uniform Standard Time?

Ballot for Officers closed.

Report of Committee on Standard Time presented.

Past President CHARLES PAINE.—I am a member of that Committee.

The PRESIDENT.—Mr. Paine will read the report.

(Mr. Paine read the report of the Committee on Standard Time, which will be found on page 54.)

The PRESIDENT.—You have heard the report of the special Committee on Uniform Standard Time; what is the wish of the Society with reference to that report?

Standard Time
Report
accepted.

Mr. CROWELL.—I move that the report be accepted and placed on file and the Committee be continued. (Carried.)

The PRESIDENT.—The next business is the report of the Committee on "Uniform Methods of Testing Materials Used in Metallic Structures and on Requirements for these Materials to Further Improve the Grade of Such Structures." Mr. Burr is the chairman of that Committee; if he is present he will please come forward and read the report. Is there any member of the Committee present?

Mr. PERCIVAL ROBERTS, Jr.—The last one named is here.

The PRESIDENT.—Do you wish to read the report of the Committee?

Mr. ROBERTS.—The small one, I do.

The PRESIDENT.—Mr. Roberts is placed in an embarrassing position; he represents the minority. Under those circumstances the Secretary will read the report, and Mr. Roberts will have an opportunity of reading the minority report afterwards.

(The Secretary read the report, which will be found on page 55.)

Report of
Committee on
Uniform
Methods of
Testing Structural
Materials
presented and
discussed.

Mr. ROBERTS.—(After reading the minority report, see page 58.) Mr. President, I hardly believe it necessary for me to add anything, except that I might say that I believe that it is a vital mistake to tie the hands of any professional man, or to limit in any way the nature of the tools, or the variety of the tools, with which he works; that in so doing, or just in proportion as we so do, we limit his originality.

Mr. T. C. CLARKE.—I wish to ask that the resolution under which this Committee was appointed be read. The reason is that if there is anything in that resolution which, as Mr. Roberts says, ties the hands of Members of this Society, I should be opposed to it. My recollection is that it does not tie the hands at all. I therefore ask that that resolution be read.

The SECRETARY.—In order to find the resolution I should have to go to the records. It is a resolution passed by the Society some years ago and voted upon by the Society, that such a committee be appointed to consider this question. In every case it is understood that reports of committees are simply the opinions of the committees, and do not bind the Society.

The PRESIDENT.—As I understand, the reports of committees are made to the Society for any action that it thinks proper to adopt.

Mr. COOPER.—I move this report be laid upon the table and the Committee discharged. (Seconded.)

My grounds for that I would state briefly, for I think you are all with me. This Society is not competent to settle any matter of engineering; we have not learned it all yet. I don't think the oldest man here can formulate this matter in a way that will distinctly settle it, yet this resolution states that it is to be formulated to further the improvement of the grade of material used in our structures. Who is more in touch with the advancements being made, day by day, in

structural material than the individual engineer who is using the material constantly? He can change the requirements day by day or week by week. He don't want to be blocked by a thing called "The Report of the Committee of the American Society of Civil Engineers on Methods of Testing Materials and the Requirements of Those Materials for Metallic Structures." If there is any uniformity in standards it belongs to the laboratory. I acknowledge that when we read of experiments made in other countries and by other engineers, it is very pretty to be able to compare them, knowing they were made under similar conditions, but I hope engineers will demand the right of liberty of conscience, and I, as an engineer, do demand whatever I want and my customers will pay for. If I want cast iron so weak that you can pick it to pieces, if it suits my purpose, I have the right to use it; and if I want to ask for cast iron that is away beyond the requirements, I have the right to do so.

I am not criticising in detail this whole report. It could be done, and I will not do so for this reason. These gentlemen sent me a circular asking me to give an opinion. I did not do so because I don't know to-day what should be a standard that should be permanently established. I know what is best to-day, but what is best to-morrow no man knows. I think this Society should not, in any manner, report upon any standard tests or standards of any kind.

Mr. JOSEPH M. WILSON.—I quite agree with Mr. Cooper in his remarks. A conscientious engineer will make his specifications suit the purpose for which he intends to use the material. His experience is improving every day; he will be obliged to modify those specifications. I think it is not wise to confine him to certain prescribed limits.

Mr. H. B. SEAMAN.—Professor William H. Burr is Chairman of the Committee —

Mr. COOPER.—Mr. President, I rise to a point of order; the motion is to lay on the table, which is not debatable.

The PRESIDENT.—The point of order is well taken.

Professor P. C. RICKETTS.—If I may make a remark, it seems to me it would be rather discourteous not to hear a member of a committee which has been appointed by the Society. I do not take one ground or the other in this thing, but it seems to me rather discourteous not to hear the member of the Committee.

The PRESIDENT.—The gentlemen must not argue the question.

Mr. J. Y. CULYER.—I would offer a substitute for that resolution; that is, that the report of the Committee be received, and, if you like, the Committee discharged. Certainly you cannot discuss a report that has not been received, nor can you lay a report upon the table that has not been received. I make that motion, or that amendment to the motion.

The PRESIDENT.—I think the point is well taken.

Discussion of
Report of
Committee on
Uniform
Methods of
Testing, etc.
(continued).

Mr. COOPER.—My object in making the motion—I am not prepared to defend the propriety of the thing—is that I do not want that report to go out in the Society publications, because then it will be an opinion of the Society. Although you may print in small letters over the head of the report that it is not the opinion, it will be quoted as a report of the American Society of Civil Engineers on Uniform Tests of Materials. It goes forth to the world as our opinion, and I, for one, do not want to be responsible for this report, in whatever way it may be said.

Mr. FITZGERALD.—It seems to me that the report should be accepted, as a matter of form. That does not mean that the Society adopts it; it simply is a matter of form. This report, should be accepted, not adopted; then we can discuss it.

The PRESIDENT.—I think that discussion is out of order. Of course we are not bound by strictly parliamentary rules. It is the opinion of the Chair that the substitute proposed by the gentleman on the right should be voted upon first, and if that is the sense of the Society, it will be so done, without further discussion. Will the gentleman please state his motion?

Mr. CULYER.—My motion is a substitute, and is strictly in accordance with parliamentary rules. It seems to me—

The PRESIDENT.—No arguments.

Mr. CULYER.—The motion is to receive the report of the Committee, simply to receive it, and then the organization can do with it as they please, endorse it or not.

The PRESIDENT.—No argument; just state the motion.

Mr. CULYER.—That is the motion; that the report be received and the Committee discharged.

Mr. COOPER.—And a motion to lay on the table can only—

Report of
Committee on
Uniform
Methods of
Testing, etc.,
received and
Committee
discharged.

The PRESIDENT.—The question before the house is, shall the report of the Committee which has been read be received and the Committee be discharged? (Question put and carried.)

Mr. A. P. BOLLER.—I move, Mr. President, to cover the objection which Mr. Cooper very properly made, that the report does not go out in the Society *Transactions* as one of its papers. It is in no disrespect to the merits of the report; it is simply to prevent the Society from being put in a false position. With that view I make the motion. (Seconded.)

The PRESIDENT.—You have heard the motion, gentlemen, that the report of this Committee, which has been received and the Committee discharged, be not published in the *Proceedings* of the Society.

Mr. HERSHEL.—Mr. President, I am not convinced that this would be a wise thing to adopt. While I am one of those who favored the report of the minority and everything that has been said up to the present time, it seems to me that this may be going a little too far.

We need not be ashamed of that report; there is nothing about it to be ashamed of, and why should we keep it out of the *Transactions*, where it would go in the ordinary course of events. I am open to conviction. I do not know any reason why such extraordinary action should be taken with the report of this Committee. There is some honest work there and the Committee is entitled to courtesy. You have really hardly heard it as yet, and if the report be only taken for what it is worth, if it be not considered an expression of the opinion of the Society, if it be not held up as a premium on stagnation instead of on progress, there is no harm in it. I think it presents present practice quite well and therefore extraordinary action does not seem to me to be called for.

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed.

The PRESIDENT.—If the gentleman will permit me to make a statement it seems to me the matter may be disposed of without trouble. This is a meeting of the Society and our proceedings here will be recorded; part of those proceedings will be the printing of this report and it need not necessarily go into the *Transactions* of the Society.

Past President GREENE.—Mr. President, is the minority report before the Society?

The PRESIDENT.—The whole subject is before the Society.

Gen. GREENE.—Then I move that if the majority report is put upon record, the minority be also.

The PRESIDENT.—There is already a motion before the house, General.

Mr. H. H. CAMPBELL.—I come here representing one of the steel manufacturing concerns, to present that side of the case, and I would say that we, as manufacturers—I may say I represent the Pennsylvania Steel Company—would be perfectly satisfied and very much pleased if the civil engineers would make what they can call a standard set of specifications. Now, I would not, and I do not think any member of the Society would, advocate that the Members be bound by that standard set of specifications; but it would be one to which you could refer, which could be altered to suit yourself, and it would be always the prerogative of every Member to alter it as occasion demanded. But I would say that this set of specifications, as drawn up here, does not suit our ideas at all.

The PRESIDENT.—The gentleman must confine himself to the question; we are not considering the merits of the report. The question before the Society is whether this report shall be entirely excluded from our *Transactions*.

Mr. CAMPBELL.—If I should argue that it was not a proper set of specifications to be incorporated, would that be in order? If I show that it is not a proper set?

The PRESIDENT.—I should think not, at this time.

Mr. CAMPBELL.—If it is not, I, of course, will not discuss it.

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed
(continued).

The PRESIDENT.—You have the right of appeal.

Mr. CAMPBELL.—Well, I will appeal, simply to place it.

(The question of appeal put to the house and the Chair sustained.)

Mr. PRESIDENT.—The motion is now before the house; will the gentleman please repeat it?

Mr. BOLLER.—The motion I made was that the report should not be incorporated in the *Transactions* of the Society. I made that motion simply for discussion, to bring out the point that Mr. Cooper suggested, that we should not commit the Society to the report.

Mr. J. J. R. CROES.—Will you permit me to ask the gentleman to withdraw his motion? It is not in order in any sense, and it is not proper in any sense, that this small meeting of a few members of the Society should undertake to suppress any discussion, any papers that have been presented to the meeting, or to prevent the Members of the Society, extending over the whole country, from knowing everything that the Society or its representatives do.

There is a little confusion, I think, in the minds of the gentlemen on the subject, and probably in the minds of a number of members who are not familiar with the details of publication of the papers of the Society. The *Proceedings* of the American Society of Civil Engineers are the records of meetings, such as is occurring now. The full report of those proceedings is bound to be printed and published and sent to every Member of the Society; and that includes the report of every committee. There is no policy of suppression desirable.

The PRESIDENT.—If the gentleman will permit me to interrupt him, that is the very suggestion that I made a little while ago.

Mr. CROES.—The *Transactions* of the Society are written matter. The *Proceedings* of the Society and the publications that are issued by the Board of Publication and published as *Transactions* are entirely different matters. The effect of this resolution will be not to prevent at all the printing and wide circulation of the report. That, as I said, cannot be done, and it would not have any effect on the Board of Direction and the Publication Committee, except, perhaps, as a hint that certain Members of the Society do not want that report to go into the *Transactions*. No small number of the Society can prevent their publishing it as a paper in the *Transactions*, if they should see fit. An expression of opinion might be made, and I think very properly, at this meeting, that it was not desirable that a report of a committee which was not unanimous, and which was not approved by a large number of Members, should go out as an expression of the opinion of the Society. But the papers that are published are none of them expressions of the opinions of the Society, and the only danger in this case is what has occurred in a good many other cases, that the report of a committee is advertised and spread abroad as the opinion of the American Society of Civil Engineers. The report of the Committee has been accepted, and, I believe, the Committee is discharged, is it not?

The PRESIDENT.—Yes, sir.

Mr. CROES.—I don't see that any other action can be taken at the present time with reference to that. The paper is not under discussion at all, unless we, as a matter of business, entirely independent of everything else, should find that a certain number of Members do not think that it ought to be published in the *Transactions*. I think the motion is out of order; there is nothing before the house at the present time.

President WILLIAM P. CRAIGHILL (from the floor).—I wish to say a few words with reference to this matter, which is a question of business before the house.

The matter, as I understand it, is this: A committee was appointed for the consideration of a certain subject. That committee has done its duty, no doubt, as we may infer from the presentation of the report. They have presented a report which was read in the presence of the Society. On motion, that report was received, which does not mean that it was accepted or adopted. Now, having been received, it becomes a part of the proceedings of the meeting of this Society, which is an entirely different thing from the formal record which we call the *Transactions*, which is sent abroad all over the world. The idea, as I understand it from the action that has already been taken, is this: That it is not desired that this Society should, in any way, endorse the report of this Committee; that has been emphatically stated in the proceedings which our stenographer is taking down here, and it will be published to the Society.

The question now before the house is, shall this report be excluded from the *Transactions* of the Society? I think that is the point which is now before the Society. It does not exclude it, it cannot exclude it, from the *Proceedings* of this Society, unless by a special vote.

Mr. H. B. SEAMAN.—I think this question is a matter for the Publication Committee. I think if any Member, or any set of Members, are opposed to the publication of this report in the *Transactions*, the Publication Committee will listen to the arguments, and I will venture to say, not a single individual member of our Committee will oppose it.

Mr. FITZGERALD.—This matter presents itself, to my mind, rather differently from what it does to that of others. We have received or accepted this report; it is now before this meeting, to determine what they will do with it. We can do anything we choose with it; but if we do not adopt it, it does not go out to the world as a report accepted and adopted by the American Society of Civil Engineers, and, if we leave the matter exactly as it is at present, it will be printed in our *Proceedings*, the discussion will be printed, and it will be seen that it has not been adopted, and it will be seen that it stands for nothing as an expression of opinion of the Society.

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed
(continued).

Mr. JOHN Y. CULYER.—There is, sir, one other feature of this case. That is, what encouragement does this Society give to a committee of its Members to expend a considerable amount of time and study in preparing a report of this character to be brought in and treated in this inhospitable way; whereas, on the contrary, a document of that kind, coming from a committee selected by this Society should be received and should have the fullest recognition in its publications. Certainly this Society need not be afraid to extend in its documents to other countries and other associations, its opinions, tentatively prepared, on a subject of this kind, and you have also the opportunity to have them corrected from time to time, as wiser men have opportunity. As a matter of courtesy, this report ought to be received and it ought to be published.

Mr. BOLLER.—Mr. President, I have been so fully convinced by Mr. FitzGerald's remarks that, as the author of that resolution, I would like to withdraw it.

Mr. COOPER.—There was no intention in my mind to prevent this report from going out in the *Proceedings*. It must go out in the *Proceedings*.

Mr. CROWELL.—Perhaps it might not be out of place——

The PRESIDENT.—Mr. Crowell, there is nothing before the house.

Mr. CROES.—The chairman of the minority of the Committee that made the report we have just been discussing seems very desirous to know whether his report was received. I told him that I understood that the motion covered the whole thing.

Report of
Committee on
International
Standards of
Iron and Steel.

The PRESIDENT.—It covers the whole subject. The next business before the Society is the report of the Committee on International Standards for the Analysis of Iron and Steel.

Past President WILLIAM METCALF.—I believe the chairman of this Committee is not present. The report is quite a long one and I think it hardly worth while to take the time of the meeting to read all of the detail in the report. I will simply make a brief statement for the information of the Members. It was discovered some five or six years ago, by the chemists, that there was quite a difference in the results of certain analyses of iron and steel which were used for structural purposes. The chemists decided that it would be a very wise thing if they could get a comparatively large quantity, for comparing, of steel of various degrees of carbon. The chemists would then undertake the analyses of these, and, finally, the result would be a standard of material to which all questions could be referred; and in case there was a discussion between the chemist of the manufacturer and the chemist of the engineer as to the quantity of any element in a given material, the chemists could get samples of these standards and compare their analyses with the standards. There has been a quantity of material furnished for that purpose and when the chem-

ists have finished their analyses, a large part of those standards will be given to this Society which will furnish enough material to make thousands upon thousands of analyses, and it will be left in the hands of the Society, to be called for by any Member who has need of it.

I will state that the very first thing the chemists discovered, in this country, when they started their investigations, was a serious difference in the quantity of carbon, and, studying that, they found a serious error in their methods. That alone has been of great value to engineers of steel works. These chemists are at work yet, and I suppose it will be a year or two years before their work will be finished; and I would suggest that the report be accepted and the committee continued, as the actual work is being done by Professor Dudley and other eminent chemists, and cannot be finished for some time.

The PRESIDENT.—The motion is simply to receive the report and continue the Committee.

Mr. FITZGERALD.—I move that the report be accepted and the Committee continued.

The PRESIDENT.—Accepted or received?

Mr. FITZGERALD.—Accepted, not adopted, and the committee continued.

The PRESIDENT.—Gentlemen, you have heard the motion, that the report of the Committee be accepted and the Committee be continued. (Question put and carried.)

(This report will be found on page 59.)

A MEMBER.—Do I understand that the Society stands as sponsor now for that report? They have accepted it instead of receiving it; we have not even heard it read.

Mr. CROES.—The older members of the Society all understand that the American Society of Civil Engineers is sponsor for nothing.

The PRESIDENT.—Do you submit any motion to the house?

Mr. CROES.—No, sir.

Professor MANSFIELD MERRIMAN.—If it is in order, I should like to make a motion in regard to the report of the Committee on Methods of Testing Iron and Steel. I move that the report be printed in the *Transactions*, and a date be set apart for its discussion, and advance copies be sent to every Member of the Society, with a request to furnish a written discussion thereon. (Seconded.)

Mr. CROES.—The motion is out of order; it infringes upon the business of the officers of the Society; it is in the nature of an instruction. It could be made in the nature of a request, or expression of opinion of this meeting, but not as an instruction to the Society.

Professor MERRIMAN.—If that is the case I modify my motion, that it is the sense of this meeting that such action be taken.

I would say that this has been almost the universal action. It was the action taken on the report of the Committee on Testing Cements;

Report
of Committee
on International
Standards of Iron
and Steel
accepted.

Motion
in regard to
Committee on
Uniform
Methods of
Testing Structural
Materials.

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed
(continued).

it was the action taken as to the report of the Committee on Form of Railroad Rails, and I think those papers have been of the greatest value to the engineering profession.

Mr. CROWELL.—In reference to the remarks of Professor Merriman, it is not usual, as a matter of practice in the Society, to print any paper in the *Transactions*, or any other matter, until after the discussion. He has suggested that the paper be printed in the *Transactions* and that it be sent out for discussion. His object would be reached by a motion to circulate this report for discussion, without printing it in the *Transactions*. As a matter of fact—and I speak as a member of the Publication Committee—the appearance of these reports is largely a matter of convenience. There are some reports that are so brief and of such concise character that they are published as a part of the *Proceedings*, which you all know is a supplementary part of the *Transactions*; and sometimes the report is so elaborate and the discussion so general that it is desirable to make it a part of the *Transactions*.

The entire object, as I understand it, can be reached by a motion to circulate the report which has been presented, for discussion, among the Members, and leave its final disposition without any order of this meeting, which order, with entire respect to the meeting, seems to me to be entirely out of place.

The PRESIDENT.—I will ask the gentleman if his motion has been seconded in the revised form?

A MEMBER.—What is the business before the house?

The PRESIDENT.—There is nothing before the house now.

A MEMBER.—As I understand it, the questions have been disposed of.

Mr. WHINERY.—In any event, this particular subject was disposed of. I rise to speak, Mr. President, to a point of order. It may be brought up and referred to at a proper time in the *Proceedings*. It is not the order before the meeting at this time, and I raise the point that it is out of order.

The PRESIDENT.—The point of order has been raised that the subject, in the order of business of this meeting, has for the present been disposed of. We have a point at which we shall arrive presently, of new business, and, if the gentleman will allow me to make a suggestion to him, the proper time for him to present it is then and not now. The Chair is inclined to sustain the point raised by Mr. Whinery, but the point of order will be referred to the house.

Professor MERRIMAN.—My motion was only made after the Chair had said that there was no business before the house.

The PRESIDENT.—The Chair stands corrected. The point of order is now before the house. Will the house proceed to the consideration of the motion of Professor Merriman? (Question put and lost.)

The PRESIDENT.—The next business in order is the report of the Committee on Units of Measurements, of which Mr. Fuertes is the chairman. If he is present we will be glad to hear from him. Is there any member of the Committee present?

Committee on
Units of
Measurement
reports
progress.

Captain WILLIAM M. BLACK.—I believe I am the only member of the Committee present. I will say that I think it is the policy of the Committee to report progress. The other members of the Committee have not been heard from recently. I don't know where they are. We met last fall and had a full meeting, all the members being present. The question of what action should be taken by the Committee came up. The Committee decided that it was too momentous for it to decide at that time. A series of questions was to be prepared by one of the members of the Committee, expressing different views of the subject, with arguments for and against the adoption of this system. This circular was to be sent out to the various manufacturing interests and others who would be most affected by a change in the system of weights and measures, and from the answers received the Committee has determined to make a report, merely collating these answers. As far as I know, this programme is still to be carried out.

Mr. WHINERY.—I move that the Committee be granted further time for consideration and report.

The PRESIDENT.—It is moved and seconded that the Committee on Units of Measurement be continued. (Carried.)

Committee
continued.

The SECRETARY.—I have just received the report of the Committee on the Award of the Norman Medal.

Norman Medal
Report read.

(The Secretary read the report, which will be found on page 67.)

The PRESIDENT.—Gentlemen, we have now reached the end of our regular programme of business. If there is any Member who has anything to propose for the consideration of the Society, this is his opportunity.

Professor MERRIMAN.—I will take this opportunity to renew my motion, which I will state in a slightly modified form.

Resolved, That it is the sense of this meeting that opportunity be given by the Publication Committee for a full discussion by the membership of the report of the Committee on Methods of Testing of Iron and Steel. (Seconded.)

Report of
Committee on
Uniform
Methods of
Testing, etc.,
again
taken up.

The PRESIDENT.—You have heard the motion, gentlemen. It is a matter of some importance; will you please repeat it?

(Professor Merriman repeated his motion.)

Mr. WHINERY.—Mr. President and gentlemen of the Society, the position of this report is this: It has been received by the Society and lies on the table; no further action has been taken; that is the parliamentary situation. As a matter of fact, the report has been printed already and sent to every Member of the Society. Furthermore, it will appear in the *Proceedings*, probably; but at any rate, it has already

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed
(continued).

been printed and circulated to every Member of the Society. If at the next Annual Convention or Annual Meeting, any Member desires to take up this matter, it will be in order to do so. The report is received and lies on the table, ready for the consideration of the Society when the Society chooses to take it up. It seems to me that the motion is entirely unnecessary.

Mr. CAMPBELL.—I should like to know why it is stated here that this report "is issued for purposes of information and discussion only." The discussion was denied to-day; how is it that it will be in order at the next meeting?

Mr. CROWELL.—There was a rule adopted by a former Annual Meeting which required, before any report of a special committee should be received, that it should be printed in this form for discussion and issued to the membership a certain time in advance of the Annual Meeting. It happened that this very report which we have been considering was presented here at a previous Annual Meeting, but it was not in a completed form, and, in order to set at rest any misunderstanding, that rule was adopted. That is the reason why that notice is placed on the face of the paper, that it is for discussion. It is also necessary in order to protect the Society against premature publication in other publications that the notice should be given in that form. As a matter of fact, a previous meeting, which has as much authority as this one, has said that these reports should be sent out for discussion.

Mr. T. GUILFORD SMITH.—It seems to me that the attempt to stifle this report and prevent discussion ought not to be entertained by the Society. It seems that this report should have been before us a year ago, for some reason, which Mr. Crowell has explained partly. There seems to be a disposition on the part of some of our Members to prevent discussion. I do not know anything about the report, whether it is right or wrong; but I think the Society owes it to itself to receive that report and discuss it fully, or we will find that men will decline to serve on committees in future. If it is in accordance with the rules and regulations adopted by the Society, I think we might be allowed considerable latitude in the interpretation of this particular regulation.

Mr. COOPER.—Mr. President, the discussion was rather unparliamentary, but I talked the matter over before the meeting, and I can say that there was no intention whatever to suppress discussion, and the fullest discussion, of this report. I believe the Society and the Publication Committee will only be too happy to receive all the discussion that the Members may choose to send in, by letter or by person, at the ordinary meetings of the Society, when it is very difficult to get interesting matters for discussion, but I think it is pretty well understood by most of us that, at the general meetings, to take up the discussion of one particular subject of that kind, to discuss the merits of it, would consume too much of the time that is necessary for the

transaction of important business. I do not think anybody had the slightest wish to suppress this report or to treat it with disrespect. The only object of the motion made was to keep the report out of the *Transactions*; it will appear in the *Proceedings*, because it is a subject to be discussed. The gentleman has suggested and—as I know—it has opened a very serious discussion; it will be discussed by Members for hours at a time, and that discussion the Society will only be too glad to have at the proper time. This is not the meeting at which to discuss such a matter; we have too much other important general business to take up. I believe the Chair and the members of the Board present will sustain me in saying that the Society will be only too glad to have all such discussion.

MR. CAMPBELL.—I would just like to say, in explanation of having a question for the decision of the Chair, as to the right of discussion on a paper, that I have come here particularly for this purpose, as a Member of the Society, and that the Secretary had written me that this paper would be under discussion at this meeting. It was for that reason that I came here to discuss the question of the acceptance of this report, the reasons why it should not be accepted, and to present my opinions as to what kind of a report should be accepted. I do not think I was out of order; but, if so, according to the precedents of the Society, I do not, of course, wish to discuss it.

MR. T. GUILFORD SMITH.—As a seconder of Professor Merriman's resolution, I would like to inquire when such a discussion will take place, when it can take place, and how it is to be inaugurated?

THE PRESIDENT.—It seems to me that now is the proper time for the discussion of the motion of Professor Merriman, and, unless the Society decides otherwise, the discussion will proceed.

MR. HERSHEY.—I think a little more may be said in explanation of the situation. As I understand it, discussion ordinarily takes place in this Society, at least the kind of discussion that we are now considering, upon papers printed in the *Transactions*, in writing, and certainly that is the only kind of discussion that is likely to be of great value from speakers such as the membership of this Society is composed of, upon a subject as abstruse as is the subject of this report. Now, I take it, the motion of Professor Merriman was made for the purpose of giving an opportunity to the membership for this kind of discussion, and it is customary that this kind of discussion should follow the publication of any paper in the *Proceedings*. While I am extremely loath to say anything in instruction of the Publication Committee, yet the sense of this meeting is certainly a proper expression for their guidance, and, as I understand it, the motion of Professor Merriman is not any more than a respectful presentation of the opinion of this meeting to the Publication Committee, that they should give an opportunity for discussion of the kind I have spoken of.

Disposition of
Report of
Committee on
Uniform
Methods of
Testing, etc.,
discussed
(continued).

There is another way in which the subject can be brought before the Society; that is, anybody can write a paper on the report, or on a similar subject, and present it in the *Transactions*. I presume the Publication Committee would be likely to print it.

Captain W. H. JAKES.—I would like to suggest, if an amendment be in order, that a date be appointed for the discussion of this paper. I should be very glad to be present at that meeting, and hope to learn something.

The PRESIDENT.—I will say to the mover of the motion, that an amendment has been proposed. It is for him to say whether he will accept it or not.

Professor MERRIMAN.—In regard to the date?

Captain JAKES.—The substance was, that a date be appointed for the discussion of this report. I will not go into detail; the President and Society know the report that is under discussion.

Mr. WHINERY.—Why not leave that to the Publication Committee?

Captain JAKES.—I asked, if in order.

The PRESIDENT.—The Publication Committee usually arranges matters of that sort. Does any gentleman wish to say anything further upon this motion? If not, the motion will be put to the house.

Resolved, That the Publication Committee be requested to assign a date and invite discussions from the Members on the report of the Committee on "Uniform Methods of Testing Materials."

(Question put and carried.)

The PRESIDENT.—I will say, that in the judgment of the Chair, the subject is still open for discussion at this meeting, if anybody desires to discuss it.

Mr. T. GUILFORD SMITH.—Is there any objection to the gentleman from the Pennsylvania Steel Company being allowed to do so?

Mr. CAMPBELL.—I do not wish to take up the time of the house. The house has already expressed its opinion that this is not the proper time. I am ready at any time the Society sees fit, at the time which is to be set by the Committee.

The PRESIDENT.—Is there any other business that any gentleman wishes to bring before the house?

Mr. FITZGERALD.—Are we waiting now for the Tellers?

The PRESIDENT.—It is so near the hour for lunch that I think we had better take a recess.

If there is no further business to be proposed at this time, the Chair will announce that a recess will be taken for the purpose of enjoying a social lunch at the Society House. The meeting will reconvene at 3 o'clock, for the purpose of hearing the announcement of the result of the ballot for officers for the next year.

Before the meeting adjourns, as I am about to vacate the chair, probably, I wish to return my thanks to the American Society of Civil

Publication
Committee to
invite discus-
sion on Report
of Committee
on Uniform
Methods of
Testing, etc.

Engineers, as here represented, and wherever I have met them, individually and collectively, for the respect and courtesy and great consideration which they have uniformly shown to me, and I thank them from the bottom of my heart for this and for the honor which they have done me, in making me the President for a year.

Adjournment
of Morning
Session.

AFTERNOON SESSION.—Col. William P. Craighill in the chair.

The PRESIDENT.—The business now before the Society is the report of the Tellers, which is ready, and is as follows :

NEW YORK, January 16th, 1895.

To the President American Society Civil Engineers :

Dear Sir,—We, the undersigned, respectfully report the following distribution of votes cast at the Annual Election for officers of the American Society of Civil Engineers on January 16th, 1895 :

Report of
Tellers of the
ballot for
Officers.

Total votes deposited.....	717
Unsigned.....	6
Thrown out on account of non-payment of dues	2 8

Leaving number of legal votes counted 709

Of which there were cast for President 691 votes as follows :

	Votes.
George S. Morison.....	390
John F. Wallace.....	244
Alphonse Fteley.....	54
Joseph Davis.....	1
Charles MacDonald.....	1
E. L. Corthell.....	1

For Vice-Presidents, to serve two years :

	Votes.
Desmond FitzGerald.....	676
Benjamin M. Harrod.....	658
Scattering.....	13

For Treasurer, to serve one year :

	Votes.
John Thomson.....	699
Scattering.....	6

For Non-Resident Directors, to serve three years :

	Votes.
George H. Benzenberg.....	697
George H. Browne.....	691
Robert Cartwright.....	695
Fayette S. Curtis.....	690
Scattering.....	24

Report of Tellers (continued). *For Resident Directors, to serve three years :*

	Votes.
Augustus Mordecai.....	686
Charles SooySmith.....	692
Scattering	24

Very respectfully,

GOUVERNEUR MORRIS,
BENJAMIN REECE,
MAX. E. SCHMIDT.

In accordance with the Constitution, which says, "The presiding officer shall announce to the meeting the names of officers elected in accordance with this section," I announce that the President of the Society for the ensuing year is Mr. George S. Morison, of Chicago.

Announce-
ment of Offi-
cers for 1895.

I announce that Messrs. Desmond FitzGerald, of Brookline, Mass., and Benjamin M. Harrod, of New Orleans, La., are elected Vice-Presidents of the Society.

I announce that Mr. John Thomson is Treasurer of the Society for the coming year.

I announce that the Non-Resident Directors elected to serve three years are Messrs. George H. Benzenberg, George H. Brown, Robert Cartwright and Fayette S. Curtis.

I announce that Mr. Augustus Mordecai and Mr. Charles SooySmith are elected Resident Directors.

There is no business before the house, unless some gentleman has something to propose for the good of the Society.

Past President METCALF.—I propose a speech from Mr. Morison, the President elect.

The PRESIDENT.—If Mr. Morison will come to the front I will be very glad to congratulate him.

Mr. Morison,
President,
introduced.

I have the pleasure, gentlemen, of introducing to you the President of the American Society of Civil Engineers.

Mr. GEORGE S. MORISON, President Am. Soc. C. E.—Gentlemen of the American Society of Civil Engineers, this is not a time for many words. When I was first advised by the Committee on Nominations of my selection for this office, I answered that I felt that it would have been better if some older man had been chosen for this place, had been selected for nomination, but that I considered the duties and the responsibilities of the place such that I had not the right to refuse them. I feel much the same way now.

I thank you for the confidence you have shown in me by the votes which you have cast for me. I recognize that, as in years past, there is a great deal of work to be done, and that the office of President is not a sinecure, but a position of extreme responsibility. I shall endeavor to meet this responsibility to the very best of my ability. Our

Society, after 27 years of active life, following 15 years before those active years, has reached a position in which it has become established as one of the leading professional societies of the world. It is not yet the first society, but it has an established position, and such an established position means responsibility as well as everything else. I trust that we shall all work hard, recognizing that responsibility, to make this Society all that we feel it ought to be.

The CHAIR.—Is there any other business to be brought before the Society? If not, before the adjournment I will say, at the request of the President, that the new Board of Direction is requested to meet in the Society House at a quarter past four this afternoon, at which a full attendance is asked.

If there is no other business before the house I now declare the Annual Meeting adjourned.

Final
Adjournment
of Annual
Meeting.
Evening
Reception.

WEDNESDAY, JANUARY 16TH, 1895.—In the evening at the Waldorf, corner Fifth Avenue and Thirty-third Street, a reception and conversation was given by the Resident Membership in honor of Non-Resident Members and the ladies of their families in attendance at the meeting, at which there were present about 275.

THURSDAY, JANUARY 17TH, 1895.—The steamer *Sam Sloan*, carrying Members and guests of the Society, about 400 in number, left Pier 13 (new number), foot of Cortlandt Street, North River, at 11 A.M., and proceeded to Willets Point, and the party was received by Lieut.-Col. W. R. King, Corps of Engineers, U. S. A., and the officers and ladies of the Post. Torpedo explosions, the exhibition of the 15-in. gun electromagnet, and examination of the various buildings of the Post, including the museum, which contains a large collection of models of river and harbor work, filled out a very enjoyable day. The return to the city was made at 17 o'clock.

Excursion to
Willets Point.

In the evening at 20 o'clock a lecture, illustrated by lantern slides, was delivered before the Society by Charles E. Emery, M. Am. Soc. C. E., on "The Utilization of the Forces of Nature."

Evening
Lecture.

The Members of the Society of the various classes, 274 in number, present at the Annual Meeting, excursion, etc., were: C. H. Allen, Kenneth Allen, Thomas W. Allen, F. J. Amweg, James C. Anderson, J. P. Anderson, William A. Ayerigg, John W. Bacon, William Henry Baldwin, William J. Baldwin, Charles J. Bates, George Baum, Arthur Beardsley, G. W. Behrman, Bernt Berger, William E. Belknap, John A. Bense, George H. Bishop, H. Bissell, William H. Bixby, William M. Black, George H. Blakeley, John Bogart, A. P. Boller, C. P. Bonnett, L. B. Bonnett, William F. Booth, A. Bonzano, George W. Bramwell, P. F. Brendlinger, J. Breuchaud, J. A. Briggs, H. Waller Brinck-

List of Mem-
bers in attend-
ance

List of Mem-
bers in attend-
ance
(continued).

erhoff, Thomas E. Brown, Jr., George H. Browne, Charles B. Brush, C. W. Buchholz, L. L. Buck, H. H. Campbell, D. S. Carll, Robert Cartwright, George W. Catt, W. A. Cattell, O. Chanute, George Hallett Clark, St. John Clarke, Thomas C. Clarke, Amory Coffin, Mendes Cohen, Francis Collingwood, H. J. Cole, E. H. Connor, Howard Constable, S. L. Cooper, Theodore Cooper, William P. Craighill, R. W. Creuzbaur, J. James R. Croes, Foster Crowell, John Y. Culyer, A. C. Cunningham, David W. Cunningham, Fayette S. Curtis, Chandler Davis, John Sterling Deans, C. H. Deans, S. L. F. Deyo, P. P. Dickinson, Richard D. Dodge, Stancliff B. Downes, A. B. Drake, James Duane, H. F. Dunham, Horace L. Eaton, C. C. Elwell, Charles E. Emery, Franz Engström, B. K. Field, Clark Fisher, Desmond Fitzgerald, A. Prescott Folwell, James Francis, H. Frazier, John R. Freeman, John Fritz, A. Fteley, F. Lynwood Garrison, Charles W. Gay, George E. Gifford, E. Sherman Gould, C. S. Gowen, Charles H. Graham, J. H. Grant, William Gray, Bernard R. Green, E. A. Greene, George S. Greene, G. S. Greene, Jr., J. E. Greiner, C. R. Grimm, Stephen S. Haight, F. H. Hambleton, George R. Hardy, Charles M. Harris, Robert L. Harris, Van Alen Harris, William J. Haskins, Arthur Haviland, D. W. Hemming, Rudolph Hering, Clemens Herschel, George Hill, S. W. Hoag, Jr., F. W. Hodgdon, Henry W. Hodge, Gilbert Hodges, Sandford Horton, E. W. Howe, J. T. N. Hoyt, Charles Warren Hunt, William R. Hutton, W. H. Jaques, A. Langstaff Johnston, George A. Just, W. J. Karner, H. C. Keith, Cassius W. Kelly, W. W. Kenby, George A. Kimball, George H. Kimball, Charles C. King, Paul S. King, Joseph W. Knap, Olin H. Landreth, Gustav Lehlbach, Eugene Lentilhon, H. R. Leonard, R. W. Lesley, G. Leverich, M. Lewinson, G. Lindenthal, Horace Loomis, Oscar Lowinson, Thomas D. Lovett, John Lundie, William W. Maclay, John MacLeod, James McNaughton, O. J. Marstrand, C. C. Martin, Walter McCulloh, James C. McGuire, Charles F. McKenna, Alex. Rice McKim, T. J. McMinn, George W. McNulty, D. N. Melvin, William Metcalf, Mansfield Merriman, Henry C. Meyer, Henry C. Meyer, Jr., Curtis Millard, Spencer Miller, L. G. Montony, S. L. Minot, Aug. Mordecai, Daniel E. Moran, George S. Morison, Gouverneur Morris, Henry G. Morse, Mace Moulton, Charles H. Myers, John H. Myers, Jr., R. E. Neumeyer, O. F. Nicols, P. Elbert Nostrand, Edward P. North, F. S. Odell, George R. Olney, L. F. Olney, S. B. Opdyke, Jr., John F. O'Rourke, Joseph O. Osgood, James Owen, Charles Paine, P. A. Peterson, Albert H. Porter, J. M. Porter, Alexander Potter, F. C. Prindle, Henry G. Prout, C. T. Purdy, George W. Rafter, Charles Walker Raymond, William G. Raymond, Benjamin Reece, Joseph R. Richards, J. T. Richards, Thomas F. Richardson, Palmer C. Ricketts, Percival Roberts, Jr., J. C. L. Rogge, Charles C. Rose, H. M. Rood, F. Rosenberg, Thomas F. Rowland, Thomas F. Rowland, Jr., A. B. Samuelson, William L. Saunders, A. C.

Savage, Richard Schermerhorn, Max. E. Schmidt, C. C. Schneider, Henry B. Seaman, Horace See, Ira A. Shaler, Frank W. Skinner, Charles H. Smith, C. W. Smith, Eugene R. Smith, J. Waldo Smith, Merrith H. Smith, T. Guilford Smith, Charles H. Snow, Charles SooySmith, E. G. Spilsbury, Charles W. Staniford, Herbert Steward, Waterman Stone, Charles T. Stowell, A. A. Stuart, Lucien A. Taylor, Gaylord Thompson, S. C. Thompson, George H. Thomson, John Thomson, T. Kennard Thomson, George C. Tingley, S. Everett Tinkham, M. M. Tidd, Calvin Tomkins, G. M. Tompson, E. E. R. Tratman, John C. Trautwine, Jr., Lee Treadwell, L. L. Tribus, W. G. Triest, A. W. Trotter, E. K. Turner, G. R. Tuska, A. S. Tuttle, A. H. Tyson, John G. Van Horne, E. B. Van Winkle, C. I. Walker, J. W. Walker, John F. Wallace, Charles D. Ward, R. Willard Ware, F. W. Watkins, A. L. Webster, Edward Wegmann, Jr., S. C. Weiskoff, S. Whinery, H. D. Whitcomb, Frank O. Whitney, William H. Wiley, J. K. Wilkes, F. Stuart Williamson, C. W. S. Wilson, Joseph M. Wilson, P. K. Yates, William B. Yereance and H. W. York.

OF THE BOARD OF DIRECTION.

JANUARY 3D, 1895.—Eleven Members present.

The following resignations were presented to the Board and duly accepted: Frank W. Handy, Assoc. Am. Soc. C. E.; George M. Farley, M. Am. Soc. C. E.; Charles F. Wood, Jun. Am. Soc. C. E.; Maxwell Smith, Jun. Am. Soc. C. E.; Koyajiro Kobayaski, Jun. Am. Soc. C. E.; Henry J. Gielow, M. Am. Soc. C. E.; Henry R. Towne, M. Am. Soc. C. E.; Boynton W. McFarland, Jun. Am. Soc. C. E.

The Annual Report of the Board of Direction was considered.

The following applicants were elected as Juniors: Myron Edwards Evans, Howard Burkhardt Green, William Jackson, Archibald Stewart Maurice, Frank Pope McKibben, Robert Blum Olney, William Fitch Smith.

Applications were considered and other routine business transacted.

JANUARY 16TH, 1895, 9.30 O'CLOCK.—Sixteen Members present.

The Report of the Board of Direction for the year ending December 31st, 1894, was adopted for presentation to the Society.

JANUARY 16TH, 1895, 16.30 O'CLOCK.—Twenty-one Members present.

The committees of Finance, Library, Publications and Membership for the coming year were appointed.

In accordance with Article VI, Section 4, of the Constitution, the election of the Secretary was taken up, and was postponed until the next regular meeting of the Board.

Mr. Thomas B. Lee was appointed Auditor for the ensuing year.

REPORT OF THE BOARD OF DIRECTION FOR THE YEAR ENDING DECEMBER 31st, 1894.

PRESENTED AT THE ANNUAL MEETING, JANUARY 16TH, 1895.

The Board of Direction in compliance with the provision of the Constitution of the Society presents its Report for the year ending December 31st, 1894.

MEMBERSHIP.

The changes in membership are shown in the following table:

	JAN. 1, 1894.			JAN. 1, 1895.			LOSSES.			ADDITIONS.		TOTALS.		
	Resident.	Non-Resident.	Total.	Resident.	Non-Resident.	Total.	By Transfer.	Resignation.	Dropped.	Death.	Transfer.	Election.	Loss.	Gain.
Honorary Members.....	6	3	9	5	4	9	..	..	..	1	*1	....	1	1
Corresponding Members.....	..	3	3	..	3	3	..	..	..	..	..	..	..	..
Members.....	208	964	1 172	209	980	1 189	1 11	6	18	16	47	36	53	45
Associate Members.....	37	109	146	42	144	186	4	..	1	12	33	5	45	45
Associates.....	21	47	68	24	49	73	..	1	1	2	..	9	4	9
Juniors.....	80	173	253	87	179	266	14	8	8	3	..	46	33	46
Fellows.....	15	32	47	12	35	47	..	..	..	1	..	1	1	1
Subscribers.....	10	25	35	9	26	35	..	..	..	..	..	..	..	..
Totals.....	377	1 356	1 733	388	1 420	1 808	19	20	15	26	19	136	80	155

* Member.	† 4 Associate Members and 2 Juniors.	‡ Juniors.
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* Member.

† 4 Associate Members and 2 Juniors.

‡ Juniors.

It will be seen by the table that the net increase during the year has been 75.

Applications for membership have been acted upon by the Board during the year as follows:

Passed to Ballot as Member.....	67
Passed to Ballot as Associate Member.....	37
Elected Honorary Member.....	1
Elected Associate.....	9
Elected Junior.....	43
Total.....	157
Awaiting action.....	50

It is gratifying to be able to note an increasing interest in the Society among foreign engineers, as shown by applications for membership and sales of papers and *Transactions*.

The losses by death during the year number 26 and considerably exceed those in any previous year. They are as follows: One Honorary Member: Allan Campbell. Eighteen Members: Sumner Homer Bodfish, Augustus William Boeke, Bernard Frank Booker, Jacob Merrill Clark, Anthony Ernest Bernhardt Feind, Abraham Gottlieb, Henry Clay Jennings, William Henry Lotz, Gorham Parsons Low, Gilbert Murdoch, John Newell, Joseph Hill Paddock, Philip M. Price, Benjamin Rhodes, Samuel Lightfoot Smedley, Lucius A. Smith, Julius Hermann Striedinger, Charles Truesdell. One Associate Member: William Frederic Behrens. Two Associates: George Hervey Ely, Joseph P. Card. Three Juniors: Arthur Leon Giblin, William Bradford Jewett, Herbert Andrew Young; and one Fellow: George Howland, Jr.

LIBRARY.

The following sums have been expended upon the library during the year:

Binding 52 volumes.....	\$70 60
Purchase of books.....	32 88
Printing catalogue of duplicates.....	251 87
Contingent expenses.....	32 88
Total.....	\$388 23
Total for previous year.....	124 12
The amount received to date for sales of duplicates in the library is.....	57 05

The additions to the library from all sources have been:

Bound volumes.....	193
Unbound volumes	152
Pamphlets	234
Maps, etc.....	8
Specifications.....	69
Total.....	656

The present number of books, pamphlets, etc., in the library is 18 522, an increase of 656 during the year.

The work of revising the catalogue and rearranging the library, which was in progress at the date of the last Annual Report has been completed, and there is now a complete card catalogue of everything in the library under both name and subject. In addition to this a list of all duplicates in the library has been compiled and classified, and sent in printed form to Members, libraries, etc., that they may be sold or exchanged for other works not now in the library. They number about 2 000.

DONATIONS.

Attention is again called to the fact, that the growth of the library is largely dependent upon legacies, and contributions of reports and

other engineering literature from Members and from others who take an interest in the Society's welfare.

SOCIETY HOUSE.

The expenditure for repairs and betterments upon the Society House has been \$147 83.

The rooms have been kept open for the convenience of Members on Wednesday evenings throughout the year.

While the present may not be a favorable time for any active movement looking towards enlarged quarters, your Board would again call attention to their desirability, and express the hope that the time may not be far distant when this enterprise may be undertaken. While the present quarters have served well their purpose, they are far from being ideal in character. One of the most serious needs is a well-arranged meeting-room.

PUBLICATIONS.

Nineteen numbers of the *Bulletin* have been issued during the year, and 1 800 copies of each number were printed. These have contained abstracts of nearly all the papers read during the year, which were sufficiently full to satisfy, in most cases, the requirements of the press for early publication. This gives time for proper editing, before papers appear in the *Transactions*.

Twelve monthly numbers of the *Transactions* and *Proceedings* have been issued during the year. One of these was that for December, 1893, and contained the last of the papers from the Engineering Congress, and the discussions on all the Congress papers. Of the extra copies of these papers which were published 150 sets were handsomely bound, each in two volumes, and copies sent to all authors of accepted papers not members of the Society, and also to each Society which had been formally invited to take part in the proceedings of the Congress.

Three back numbers of the *Transactions* have been reprinted during the year, but others will be required in the near future.

The following table gives a summary of the number of pages, plates and cuts printed during the year:

	Number of Pages Printed.	Number of Plates.	Number of Cuts.
<i>Transactions</i>	1 252	166	192
<i>Proceedings</i>	204		
Indexes and Tables of Contents.	77		
<i>Bulletins</i>	123		
Reprints	92		
Constitution and List of Mem- bers (partly in last year's bills)	164		
Total pages	1 912		

The 160 plates published make the equivalent of 273 pages of the *Transactions*.

The cost of publications has been:

For Paper, Printing and Binding <i>Transactions</i> and <i>Proceedings</i>	\$5 152 70
For Plates and Cuts, Drafting, Reproducing	2 358 31
Folding and Inserting	666 72
For Paper and Printing 19 <i>Bulletins</i>	341 68
For 5 550 Advance Copies of Papers	233 70
For 18 325 Extra Copies of Papers	1 073 95
For 2 300 Extra Copies of Memoirs	91 80
For Indexes	277 84
For Reprinting three back numbers of <i>Transactions</i>	477 58
For the time of Officers, Clerks and Stenographers, charged to Publications	2 570 39
For Copyright, Wrappers and Sundry Expenses charged to Publications	135 24
For Commissions on Advertisements	333 50
Total	\$13 713 41
Deduct amount received for Advertisements	\$2 577 50
Deduct amount received for Sale of Papers, etc. .	2 194 45
	<hr/> 4 771 99
Net cost of Publications	\$8 941 42
“ “ for previous year (including charges to Engineering Congress)	16 490 16
Net cost for previous year (excluding charges to Engineering Congress)	10 965 12
Postage paid on Publications	\$2 654 19
“ on Publications for previous year	1 310 81

POSTAL RATES.

A considerable increase in the expense of the publications for the year was incurred through the refusal of second-class postal rates to the Society. Through the earnest efforts of this and other societies a law was passed at the last session of Congress, granting these rates to all such societies, and a permit for the reduced rates was obtained on August 15th. The future saving to the Society will be at the rate of over \$2 000 per year.

SOCIETY BADGE.

The special committee on this subject made a report at the Annual Convention in June last, recommending a design which it had prepared, and the report was accepted and the badge adopted by the

Society. Since that time the necessary dies have been prepared by Messrs. Tiffany & Co., and the badges are now being furnished to such as desire them, 152 having already been ordered.

The adoption by your Board of more stringent rules respecting the issue and return of badges and Certificates of Membership will, it is believed, make them of greater value in the future.

TRAVELING CERTIFICATES.

A handsomely engraved card certifying to membership in the Society has been prepared for the use of Members visiting foreign societies, taking the place of the former printed certificate.

MEETINGS.

Twenty meetings of the Society have been held during the year; this includes the Annual Meeting in New York on January 16th and 17th, and the Annual Convention at Niagara Falls, June 20th to 25th. At these meetings 44 papers were read, which were discussed either orally or in writing by 210 Members and others.

PRIZE PAPERS.

The Norman Medal for 1893 was awarded to Desmond FitzGerald, M. Am. Soc. C. E., for the paper on "Rainfall, Flow of Streams and Storage."

The Rowland Prize for 1893 was awarded to William M. Black, M. Am. Soc. C. E., for the paper on "The Improvement of Harbors on the South Atlantic Coast of the United States."

THE COLLINGWOOD PRIZE FOR JUNIORS.

At the last Annual Meeting a gift of \$1 000 was made to the Society by F. Collingwood, M. Am. Soc. C. E., as a fund, the interest of which is to be awarded annually as a prize for the best paper presented during the year by a Junior.

The gift was duly accepted, and a code of rules governing the award has been adopted by the Board of Direction. The award will consist of the sum of \$50 in cash and an engraved certificate signed by the President and Secretary.

The first award will be made at the next Annual Convention for the best paper by a Junior published in the *Transactions* during 1894.

FINANCES.

The reports of the Treasurer, Auditor and of the Finance Committee are appended.

By order of the Board of Direction.

F. COLLINGWOOD,
Secretary.

REPORT OF THE TREASURER

FOR THE YEAR ENDING DECEMBER 31ST, 1894.

Balance on hand December 31st, 1893.....	\$4 191 13	
Receipts, January 1st to December 31st, 1894..	37 400 35	
Payments of audited vouchers, January 1st to December 31st, 1894.....		\$35 254 67
Balance on hand December 31st, 1894:		
In Bank and Trust Company. \$5 341 93		
In hands of Secretary.....	994 88	6 336 81
	<u>\$41 591 48</u>	<u>\$41 591 48</u>

There has also been received a railroad bond of \$1 000 from Francis Collingwood, M. Am. Soc. C. E., which has been placed with the other securities of the Society, and which forms the fund for the Collingwood Prize. It is described below.

During 1894 there have been received 1 928 checks, drafts and money orders, all of which have been endorsed and collected.

The disbursements have been made by 345 checks signed by the Secretary and the Treasurer.

The securities on hand are as follows:

One Chicago and North Western Railway Bond, 5%, coupon, par value.....	\$1 000
Seven Pennsylvania Railroad General Mortgage Bonds, 6%, registered, par value.....	7 000
Four Pennsylvania Railroad General Mortgage Bonds, 6%, coupon, par value.....	4 000
One Rio Grande Western Railway Bond, 4%, coupon, par value.....	1 000
One Pittsburgh and Western Railway Bond, 4%, coupon, par value.....	1 000
One Lexington and Big Sandy Railroad Bond, 5%, coupon, par value.....	1 000
One Certificate Croton Aqueduct Stock of the City of New York, 7%, registered, par value.....	1 000
Ten Shares Stock Consolidated Gas Company of the City of New York, par value.....	1 000

Respectfully submitted,

JOHN BOGART,
Treasurer.

REPORT OF THE AUDITOR FOR THE

TO THE BOARD OF DIRECTION OF THE

GENTLEMEN,—I have the honor to present the following statement beginning January 1st, 1894.

RECEIPTS.

Balance on hand December 31st, 1893.....	\$4 191 13
Entrance Fees.....	\$3 005 00
Current Dues.....	20 989 43
Past Dues.....	811 80
Dues for year beginning January 1st, 1895	4 217 25
Sales of Publications	2 194 45
Badges.....	1 045 75
Certificates of Membership.....	105 60
Advertisements.....	2 577 50

Interest :

On Pennsylvania Railroad Bonds	\$660 00
On New York Croton Aqueduct	
Stock	70 00
On Chicago and North Western	
Railroad Bond.....	50 00
On Consolidated Gas Stock.....	80 00
On Pittsburgh and Western Rail-	
road Bond.....	40 00
On Rio Grande and Western	
Railroad Bond.....	40 00
On Elizabethtown, Lexington	
and Big Sandy Railroad	
Bond	50 00
On Union Trust Company De-	
posit.....	83 89
	<hr/>
	1 073 89
Compounding Dues.....	650 00
Fellowship Fees.....	250 00

Other Sources :

Donation for Library from Local Com-	
mittee of Niagara Falls Convention.	97 55
Sales of Library Duplicates.....	57 05
General Committee of the Engineering	
Societies at Chicago.....	300 00
Miscellaneous.....	25 08
	<hr/>
	37 400 35
	<hr/>
	\$41 591 48
	<hr/>

YEAR ENDING DECEMBER 31st, 1894.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

of receipts and disbursements for the fiscal year of the Society,

DISBURSEMENTS.

Interest on Mortgage.....	\$800 00
Taxes	411 70
Stationery and Printing.....	1 095 89
Postage	3 790 36
Publications.....	13 713 41
Library	1 615 95
Convention and Annual Meeting.....	1 419 14
Janitor.....	720 00
House Supplies and Furniture.....	220 12
Fuel	166 00
Water.....	17 00
Gas.	100 85
Certificates of Membership.....	112 90
Badges.....	856 87
Work of Committees.....	168 00
Safe Deposit	24 00
Norman Medal and Rowland Prize.....	124 04
Finance and Accounts.....	1 781 00
Repairs and Betterments, Society House.....	147 83
Engineering Congress.....	1 239 05
Current Business	6 376 05
Other Expenditures.....	354 51
	<hr/>
	\$35 254 67
Balance in Bank and Trust Co., and in hands of Secretary.....	6 336 81

\$41 591 48

The compensation paid to each person in the service of the Society during the past year is stated below, and also the several accounts to which these payments have been distributed by the Finance Committee:

Francis Collingwood, Secretary.....	\$4 000 00	
Charged to Publications.....	\$215 00	
Current Business.....	3 455 00	
Work of Committees.....	70 00	
Convention and Annual Meeting..	200 00	
Engineering Congress.....	10 00	
Finance and Accounts.....	50 00	4 000 00
<hr/>		
John Bogart, Treasurer.		
Charged to Finance and Accounts	\$600 00	
<hr/>		
Charles Warren Hunt, Assistant Secretary and Librarian...	\$2 500 00	
Charged to Publications	\$1 238 00	
Library	289 00	
Current Business.....	535 00	
Work of Committees.....	20 00	
Convention and Annual Meeting .	157 00	
Finance and Accounts	261 00	2 500 00
<hr/>		
Thomas B. Lee, Auditor and Chief Clerk.....	\$1 800 00	
Charged to Publications.....	\$215 00	
Current Business	610 00	
Work of Committees.....	40 00	
Convention and Annual Meeting..	115 00	
Finance and Accounts	820 00	1 800 00
<hr/>		
M. T. Jefferis, Assistant Librarian.....	\$1 237 00	
Charged to Publications	\$311 00	
Library	863 00	
Current Business.....	63 00	1 237 00
<hr/>		
B. J. Burke, Clerk.....	\$1 056 00	
Charged to Publications.....	\$200 00	
Current Business	788 00	
Convention and Annual Meeting..	68 00	1 056 00
<hr/>		

JANUARY PROCEEDINGS.

51

D. J. Mullen, Stenographer and Typewriter.....		\$780 00
Charged to Publications	\$122 00	
Current Business.....	598 00	
Work of Committees.....	34 00	
Convention and Annual Meeting..	21 00	
Library	5 00	780 00
<hr/>		
M. A. Kent, Office Boy.....		\$97 50
Charged to Publications	\$43 00	
Library	40 00	
Current Business.....	14 50	97 50
<hr/>		
John J. Bower, Office Boy.....		\$110 00
Charged to Publications	\$27 00	
Library	25 00	
Convention and Annual Meeting..	2 50	
Current Business.....	55 50	110 00
<hr/>		
E. G. Crans, Stenographic Reporter.....		\$359 25
Charged to Publications	\$199 39	
Convention and Annual Meeting..	155 86	
Work of Committees.....	4 00	359 25
<hr/>		
Arthur C. Mander, Janitor.....		
Charged to Janitor.....		\$720 00
<hr/>		
Total compensation paid.....		<u>\$13 259 75</u>

DISTRIBUTION OF TOTAL COMPENSATION PAID.

Publications	\$2 570 39
Library	1 222 00
Janitor.....	720 00
Finance and Accounts.....	1 731 00
Work of Committees.....	168 00
Convention and Annual Meeting.....	719 36
Current Business	6 119 00
Engineering Congress.....	10 00
<hr/>	
Total	<u>\$13 259 75</u>

The compensation paid to each person in the service of the Society during the past year is stated below, and also the several accounts to which these payments have been distributed by the Finance Committee :

Francis Collingwood, Secretary.....	\$4 000 00
Charged to Publications.....	\$215 00
Current Business.....	3 455 00
Work of Committees.....	70 00
Convention and Annual Meeting..	200 00
Engineering Congress.....	10 00
Finance and Accounts.....	50 00 4 000 00

John Bogart, Treasurer.

Charged to Finance and Accounts	\$600 00
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Charles Warren Hunt, Assistant Secretary and Librarian...	\$2 500 00
Charged to Publications	\$1 238 00
Library	289 00
Current Business.....	535 00
Work of Committees.....	20 00
Convention and Annual Meeting .	157 00
Finance and Accounts	261 00 2 500 00

Thomas B. Lee, Auditor and Chief Clerk.....	\$1 800 00
Charged to Publications.....	\$215 00
Current Business	610 00
Work of Committees.....	40 00
Convention and Annual Meeting..	115 00
Finance and Accounts	820 00 1 800 00

M. T. Jefferis, Assistant Librarian.....	\$1 237 00
Charged to Publications	\$311 00
Library	863 00
Current Business.....	63 00 1 237 00

B. J. Burke, Clerk.....	\$1 056 00
Charged to Publications.....	\$200 00
Current Business	788 00
Convention and Annual Meeting..	68 00 1 056 00

JANUARY PROCEEDINGS.

51

D. J. Mullen, Stenographer and Typewriter.....		\$780 00
Charged to Publications	\$122 00	
Current Business.....	598 00	
Work of Committees.....	34 00	
Convention and Annual Meeting..	21 00	
Library	5 00	780 00
<hr/>		
M. A. Kent, Office Boy.....		\$97 50
Charged to Publications	\$43 00	
Library	40 00	
Current Business.....	14 50	97 50
<hr/>		
John J. Bower, Office Boy.....		\$110 00
Charged to Publications	\$27 00	
Library	25 00	
Convention and Annual Meeting..	2 50	
Current Business.....	55 50	110 00
<hr/>		
E. G. Crans, Stenographic Reporter.....		\$359 25
Charged to Publications	\$199 39	
Convention and Annual Meeting..	155 86	
Work of Committees.....	4 00	359 25
<hr/>		
Arthur C. Mander, Janitor.		
Charged to Janitor.....		\$720 00
<hr/>		
Total compensation paid.....		<u>\$13 259 75</u>

DISTRIBUTION OF TOTAL COMPENSATION PAID.

Publications	\$2 570 39
Library	1 222 00
Janitor.....	720 00
Finance and Accounts.....	1 731 00
Work of Committees.....	168 00
Convention and Annual Meeting.....	719 36
Current Business	6 119 00
Engineering Congress.....	10 00
<hr/>	
Total	<u>\$13 259 75</u>

The Funds of the Society are as follows :

Fellowship Fund:

Ninety-eight subscriptions to December 31st, 1893.....	\$11 150 00
Premium and accumulated interest, December 31st, 1893	1 388 28
Fund on hand December 31st, 1893	\$12 538 28
One subscription received during 1894.....	250 00
Interest received during 1894.....	613 75
	<hr/>
Expended for Publications during 1894.....	613 75
Total amount in this Fund, December 31st, 1894...	<hr/> \$12 788 28 <hr/>

The present investment of this Fund is :

Nine Pennsylvania Railroad Bonds, cost.....	\$11 111 82
One Chicago and North Western Railroad Bond, 5%, cost.....	1 035 00
Cash	641 46
	<hr/>
	\$12 788 28

Compounding Fund :

Six payments at \$325.....	\$1 950 00
Nine payments at \$250	2 250 00
	<hr/>
	\$4 200 00

The present investment of this Fund is :

One Pennsylvania Railroad General Mortgage Bond, 6%, cost.....	\$1 222 50
Ten Shares Consolidated Gas Company of New York, cost	972 50
One Pittsburgh and Western Railroad Bond, 4%, cost.....	818 75
One Rio Grande Western Railroad Bond, 4%, cost.....	773 75
Cash	412 50
	<hr/>
	4 200 00

Normal Medal Fund :

One Certificate Croton Aqueduct Stock, New York City.....	1 000 00
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Rowland Prize Fund :

One Pennsylvania General Mortgage Bond, 6%, cost...	1,222 50
Carried forward.....	<hr/> \$19 210 78

Brought forward	\$19 210 78
Collingwood Prize Fund :	
One First Mortgage Bond, 5%, Elizabethtown, Lexington and Big Sandy Railroad.	1 000 00
Total investments	\$20 210 78

Respectfully submitted,

THOMAS B. LEE,

Auditor.

DECEMBER 31st, 1894.

REPORT OF THE FINANCE COMMITTEE.

The Committee submits the following comparative statement :

	1893.	1894.
Balance on hand	\$3 008 74	\$4 191 13
Receipts (less Engineering Congress for 1893)	33 496 29	37 400 35
Total	\$36 505 03	\$41 591 48
Balance carried forward	4 191 13	6 336 81
Capital invested	18 310 78	20 210 78

The Committee also reports that they have performed the duty of auditing all the bills which have been paid during the past year, and have found that each bill has been charged to its proper account.

They have also seen that the investments, transfers and deposits have been made as detailed in the reports of the Auditor and Treasurer.

In accordance with the provision of the Constitution, the accounts and financial books of the Society have been examined and found correct by an expert accountant.

The Committee recommends that as much as possible of the cash balance on hand, together with the \$1 000 now available in the Investment Fund, be invested in proper securities.

L. L. BUCK.

CHAS. MACDONALD,

C. C. MARTIN,

JOS. M. WILSON,

Committee on Finance.

REPORT OF SPECIAL COMMITTEE ON UNIFORM
STANDARD TIME.

The following is submitted on behalf of the Special Committee on Standard Time.

The reform in time reckoning, in which the American Society of Civil Engineers has taken such a prominent part, continues to make steady progress throughout the world. Among other evidences of advancement there has recently been a movement to carry into effect the sixth resolution of the Washington International Conference of 1884, in which is proposed a fundamental change in the mode of reckoning astronomical time, by bringing it into agreement with the reckoning of civil time.

Appended will be found a report on this branch of the subject from the Joint Committee of the Canadian Institute and the Astronomical and Physical Society of Toronto. This joint committee has, during the past two or three years, been in communication with the astronomers of all nations and obtained an expression of individual views, by which it appears that there is a preponderating weight of opinion among astronomers that the recommendation of the Washington Conference should be adopted, and that the astronomical day should hereafter be changed so as to agree with the civil day. The Joint Committee, therefore, recommend that some common international understanding be reached, by which all nations shall assent to the change in order that nautical almanacs may be made conformable to the change.

This report was transmitted by the Governor-General of Canada to the British Government in June last, and it has since been sent by the British Foreign Office to the Governments of other nations, along with a communication informing them, among other things, that the British Admiralty under whose supervision the Nautical Almanac is published, are prepared to carry out the change "provided that other nations who publish astronomical ephemerides desire the change and will take the same action."

It is now 10 years since the original resolution to bring about the unification of astronomical, nautical and civil time was unanimously passed by the delegates from all civilized nations assembled at Washington. The proposal has now a fair prospect of being realized, and it must be obvious that the unification of the several reckonings will have an important bearing on the 24-hour notation movement which this Society has so long advocated. The astronomical practice has always been to count the hours in a single series from 1 to 24 and when the astronomical day is made to agree with the civil day, the tendency will be to influence the adoption of this rational mode of notating the hours in civil life.

SANDFORD FLEMING, *Chairman.*

CHARLES PAINE.

THEO. N. ELY.

DECEMBER 17TH, 1894.

FINAL REPORT OF THE SPECIAL COMMITTEE ON UNIFORM
METHODS OF TESTING MATERIALS USED IN METALLIC
STRUCTURES, AND ON REQUIREMENTS FOR THESE
MATERIALS TO FURTHER IMPROVE THE
GRADE OF SUCH STRUCTURES.

To the American Society of Civil Engineers :

GENTLEMEN,—Your Committee on Uniform Methods of Testing Materials in Metallic Structures, etc., begs to offer the following majority report, which it desires to have considered as final, unless the Society shall consider it advisable to lay it before its Members for discussion until the Annual Convention in June next.

We have given the matter very careful consideration in which we have been aided by the answers to our circular of inquiry which have already been laid before the Society in our report of progress. The results of that consideration have led your Committee to the opinion that standard specifications for uniform methods of testing material used in metallic structures should be of such general character as will meet the requirements of usual conditions, so that their adoption may best subserve a more nearly uniform practice in shops and mills, and at the same time leave the engineer free to meet the special needs of any unusual conditions by supplementary or other specifications; hence the following recommendations have been framed with those ends in view.

Inasmuch as cast and wrought iron, rolled steel and steel castings are the most commonly used in metallic structures, your Committee decided to restrict its functions to the consideration of those materials. A thorough examination of a large number of existing specifications, as well as the leading literature upon the subject, supplemented by correspondence with material producers in some special cases, has led your Committee to the following conclusions and recommendations :

CAST IRON.

The infrequent use of this material justifies only the most simple and convenient tests; hence, we recommend the transverse tests of a specimen 2 x 1 ins. in section and 27 ins. long, resting flatwise on dull knife-edge supports 24 ins. apart, centers, with an applied weight of 2 000 lbs. or more, midway between them. The specimen, if of satisfactory strength when cast under the same circumstances as those which attend the casting of the full-sized piece, must carry at least the minimum weight named above, and exhibit when broken the fracture of gray iron of good quality. Failure shall be produced in not less than two minutes nor more than five minutes from application of the

first load, and the bar must show a center deflection before breaking of at least $\frac{3}{16}$ in., and must indicate a good quality of gray iron.

WROUGHT IRON.

Although the answers received from our letter of inquiry do not indicate that the Members of the Society in the aggregate place a very high value upon the reduction of area of the fractured section, your Committee believes that the requirement of a proper value for it should be prescribed. Its value is always easily ascertained, and its indications may at times be of considerable importance.

The Committee also recommends that the expression "elastic limit" be confined in its use to its original meaning, since its more general adoption leads to ambiguity and to useless discussion and dissension. The usual methods of testing indicate the first strength or "yield point" of the material, and in order to avoid the objections already mentioned, the Committee has confined itself to the expression "yield point" when applied to practical testing. The "drop of beam" is considered sufficiently accurate to determine the "yield point," but the increased accuracy of autographic records, or use of instruments of precision, is recommended.

Experimental investigations show that the relative dimensions of a test piece become of little practical consequence if the gauged length exceeds about four times the greatest diameter of the specimen. It is therefore recommended that a minimum gauged length of 8 ins. be used for the general practice of testing specimens, with a distance of not less than 12 ins. between shoulders of the specimen, or between the jaws of the testing machine. Under these conditions, however, it is understood that the gauged length shall in no case be less than four times the greatest diameter of the test piece, and that the minimum thickness shall be $\frac{1}{4}$ in.; also that the sectional area of test piece shall not be less than $\frac{1}{2}$ sq. in. In obtaining the final elongation the curves of reduction each side of the point of fracture should be included in the measured length.

In testing it is recommended that the load be applied continuously and at a rate as nearly as practicable of 4 000 to 5 000 lbs. per square inch per minute below the yield point, and of 7 000 to 8 000 lbs. above the yield point.

It is recommended that the ordinary bending test be continued, and that it be made rapidly with pressure, rather than with blows of a hammer, as the results are thereby more comparable. The nicked bending or fracture test, however, does not show any essential property of the material which would not be disclosed by the tests already mentioned, and hence its adoption is not recommended.

For the requirements of wrought iron with the tests outlined, the following are recommended:

	Bars, per square inch.	Tension plate, angle and other shapes.	Compression plate, angle and other shapes.	Web plates.
Yield point.....	26 000	26 000	26 000	26 000
Ultimate.....	50 000	48 000	48 000	46 000
Elongation in 8 ins.....	20%	15%	12%	8%
Reduction.....	30%	20%	16%	12%

Specimens should bend cold 90° without fracture, with inner radius of bending not exceeding twice the thickness of the test piece for bar iron, nor three times that thickness for plate and shape iron.

Rivet iron must be soft and tough, and pieces of the full diameter of the rivet must be capable of bending cold until their sides are in close contact without showing signs of fracture.

ROLLED STEEL.

The methods of testing wrought iron, may in general, be applied to rolled steel. In addition to these, however, the quenching test may be used to advantage, by which a specimen heated to cherry red is to be quenched in water of 82° Fahr., and then tested as usual.

The drifting test is not recommended as a requirement for quality, and the annealing test is recommended only for full-size eye-bars.

For the requirements of rolled steel, it is recommended that a mean ultimate resistance be specified for each grade of steel, and that the ultimate resistance of the test specimen should not vary more than 4 000 lbs. per square inch either way from the resistance specified. It is also recommended that the yield point, the elongation and the reduction of area each be a function of the ultimate strength found in the test specimen.

The following requirements are recommended for the various grades of steel:

ULTIMATE STRENGTH PER SQUARE INCH.

Low steel..... 60 000 lbs. \pm 4 000
 Medium steel..... 65 000 " \pm 4 000
 High steel..... 70 000 " \pm 4 000
 Yield-point = 55% of the ultimate resistance of specimen

Percent. elongation in 8 ins. = $\frac{1\ 500\ 000}{\text{Ultimate}}$

Percent. reduction of area = $\frac{2\ 800\ 000}{\text{Ultimate}}$

Rivet steel when heated to a low cherry red and quenched in water at 82° Fahr. must bend to close contact without sign of fracture.

Specimens of low steel when treated and tested in the same manner must stand bending 180° to a curve, whose inner radius is equal to the thickness of the specimen, without sign of fracture. Specimens of medium steel, as cut from bars or plates and without quenching, must stand bending 180° to an inner radius of one and one-half times the thickness of the specimen without sign of fracture; while those of high steel, also without quenching, must stand bending 180° to a radius of twice the thickness of the specimen without sign of fracture.

STEEL CASTINGS.

In steel castings the tension test is recommended, with the following requirements:

Ultimate.....	65 000 lbs. per square inch.
Yield-point	35 000 " "
Elongation in 8 ins. =	15%
Contraction =	25%

FULL-SIZE MEMBERS.

It is deemed inadvisable at present to recommend any special requirements for full-size members, as it is considered preferable to leave those requirements for specification by the engineer.

Respectfully submitted,

(Signed)

JAMES G. DAGRON,
ROBERT W. HUNT,
HENRY B. SEAMAN,
WILLIAM H. BURR.

To the American Society of Civil Engineers :

GENTLEMEN,—I regret to be unable to agree with the conclusions arrived at in the majority report as prepared by the "Committee on Standard Methods of Testing Iron and Steel."

The points upon which I disagree I hardly think it necessary to touch upon at present, for, as a result of considerable deliberation, I do not deem it advisable to recommend to the Society any definite set of specifications, believing it to be the prerogative of the engineer, as of any other professional man, to select and specify such tools and methods of procedure as he deems most expedient and suitable for the case with which he deals; but I do recommend, that whenever possible, and wherever he may not have particular features to introduce, or peculiar conditions to meet, that he specify for his material a grade which may be in general use by the majority of engineers, as by so doing, he is more certain of obtaining a uniform product, and of reducing the delays of manufacture to a minimum—two points which are of the greatest importance to both engineer and manufacturer.

Respectfully submitted,

(Signed)

PERCIVAL ROBERTS, Jr.

INTERNATIONAL STANDARDS FOR THE ANALYSIS OF IRON
AND STEEL.

REPORT OF SUBCOMMITTEE ON METHODS.

No. 2.

ANALYSIS OF STANDARD STEELS.

To the American Society of Civil Engineers:

The five samples of steel obtained as mentioned in the first report of the Subcommittee* have been analyzed for phosphorus by each member of the Subcommittee, the results obtained being given below as follows:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Mr. W. P. Barba.....	0.041	0.015	0.095	0.091	0.041
Mr. A. A. Blair.....	0.040	0.016	0.098	0.091	0.041
Dr. T. M. Drown.....	0.042	0.016	0.104	0.090	0.042
Dr. C. B. Dudley.....	0.040	0.016	0.099	0.097	0.039
Mr. P. W. Shimer.....	0.041	0.017	0.098	0.096	0.039

Sample No. 1 is an ordinary open-hearth steel. Sample No. 2 is a crucible steel. Sample No. 3 is an open-hearth steel to which metallic arsenic was added while in the molten condition in a crucible. Sample No. 4 is an ordinary Bessemer rail steel. Sample No. 5 is the No. 5 sample of the Committee on International Standards, and is an open-hearth steel.

The complete analyses as made by Mr. Blair are as follows:

No.	Carbon.	Phos- phorus.	Manga- nese.	Sulphur.	Silicon.	Copper.	Arsenic.
1	0.950	0.040	0.388	0.030	0.184	0.056	0.020
2	1.006	0.016	0.041	0.015	0.364	none	0.003
3	0.466	0.098	0.720	0.043	0.296	0.056	0.185
4	0.589	0.091	0.831	0.067	0.050	0.005	0.014
5	0.032	0.041	0.289	0.031	0.002	0.021	0.043

It will be observed that the agreement in the results on phosphorus obtained by the different chemists is very good. The exceptions are the No. 3 steel, which contains arsenic in considerable amount, and where the discrepancy is 0.009%, and in the No. 4 steel, where the discrepancy is 0.007 per cent. Considerable work was done on the No. 4 sample, in an effort to reconcile discrepancies, and it was found that the turnings from this sample were irregular, and that two different bottles of the sample gave different results. The average of six determinations from one bottle was 0.1057, and the average of five determinations from another bottle was 0.0964 per cent. Furthermore, siftings from quite an amount of the turnings gave 0.140 per cent. The experience with this sample is worthy of note. The piece of steel from which the turnings were made was a billet about 4 ins. square and

* See Vol. XX, page 145, Proceedings Am. Soc. Civ. Engrs., for Report No. 1.

14 ins. long. This was centered in a lathe, and a portion about 4 ins. long near one end was turned down to a round, the turnings being thrown away. The round portion was then turned down to about $\frac{3}{4}$ in. diameter, the turnings being saved. The turning was not all done at one time, other work intervening. An effort was made to get as fine turnings as possible, but on examining the chips after the work was done, some were found to be coarser than others, either because the tool was not always set to cut the same, or possibly because the phosphorus being higher toward the center of the billet owing to segregation, the chips broke up more where the higher phosphorus was. In order to render the sample as uniform as possible, the whole lot of turnings or chips was thoroughly mixed, but, as the results show, uniformity was not obtained. It seems possible that No. 4 sample will have to be disregarded in future work, or possibly replaced by another sample. The experience with this sample is not unique. Chemists have for a long time recognized the difficulty of getting uniform samples for analysis from segregated steel. The Subcommittee is putting study on this point, and may succeed in recommending some way out of the difficulty.

It should be stated that in the work on these five samples, each of the chemists used his own method, with any modifications peculiar to himself, when he desired, no attempt being made to secure uniformity of results by agreeing upon any points in the methods before the work was done. In view of the uniformity of the results, it is believed that a statement of the methods used with some detail will be of considerable value to the chemical world.

Mr. Blair used the following method :

Dissolve 10 grammes of drillings in a No. 4 Griffin's beaker in 75 c.c. strong nitric acid. Evaporate the solution to dryness in the air bath, replace the cover, and heat until the nitrate of iron is nearly all decomposed. Cool, add 60 c.c. hydrochloric acid, heat gradually until the oxide of iron is dissolved, and evaporate to dryness again in the air bath. Cool, dissolve in 50 c.c. hydrochloric acid, dilute to about 250 c.c. Heat the solution nearly to boiling, remove the beaker from the heat, and add gradually from a small beaker a mixture of 20 c.c. sulphite of ammonia and 40 c.c. ammonia, stirring constantly. The precipitate which forms at first redissolves, and when all but about 2 or 3 c.c. of the sulphite of ammonia solution has been added, replace the beaker over the heat. If at any time while adding the sulphite of ammonia solution, the precipitate formed will not redissolve, even after vigorous stirring, add a few drops of hydrochloric acid; when the solution clears, continue very slowly the addition of the sulphite of ammonia. After replacing the beaker over the heat, add to the solution (which should smell quite strongly of sulphurous acid) ammonia, drop by drop, until the solu-

tion is quite decolorized, and until finally a slight greenish precipitate remains undissolved, even after vigorous stirring. Now add the remaining 2 or 3 c.c. of the sulphite of ammonia solution, which should throw down a white precipitate, which usually redissolves, leaving the solution quite clear and almost perfectly decolorized. Should any precipitate remain undissolved, however, add hydrochloric acid drop by drop, until the solution clears, when it should smell perceptibly of sulphurous acid. If the reagents are used in exactly the proportions indicated, the reactions will take place as described, and the operations will be readily and quickly carried out. If the solution of sulphite of ammonia is weaker than it should be, of course the ferric chloride will not be reduced, and the solution at the end of the operation described above will not be decolorized, and will not smell of sulphurous acid. In this case add more of the sulphite of ammonia, without the addition of ammonia, until the solution smells strongly of sulphurous acid, then add ammonia until the slight permanent precipitate appears, and redissolve in as few drops of hydrochloric acid as possible.

The solution being now very nearly neutral, the iron in the ferrous condition, and an excess of sulphurous acid being present, add to the solution 5 c.c. of hydrochloric acid to make it decidedly acid and to insure the complete decomposition of any excess of the sulphite of ammonia which may be present. Boil the solution while a stream of carbonic acid passes through it, until every trace of sulphurous acid is expelled, then pass a current of sulphureted hydrogen through it for about 15 minutes, to precipitate any arsenic which may be present, and finally allow the solution to stand in a warm place until the smell of sulphureted hydrogen has disappeared, or better, pass a current of carbonic acid through the solution, which will expel the sulphureted hydrogen in a few minutes. Filter from any precipitated sulphide into a No. 5 beaker, wash with cold water, and to the filtrate add a few drops of bromine water, and cool it by placing the beaker in cold water. To the cold solution add ammonia from a small beaker very slowly, and finally, drop by drop, with constant stirring. The green precipitate of ferrous hydrate, which forms at first, is dissolved by stirring, leaving the solution perfectly clear, but subsequently, although the green precipitate dissolves, a whitish one remains, and the next drop of ammonia increases the whitish precipitate or gives it a reddish tint and finally the greenish precipitate remains undissolved, even after vigorous stirring, and another drop of ammonia makes the whole precipitate appear green. If before this occurs the precipitate does not appear decidedly red in color, dissolve the green precipitate by a drop or two of hydrochloric acid, and add a little bromine water, 1 or 2 c.c., then add ammonia as before, and repeat this until the reddish precipitate is obtained, and then the green coloration as

described above. Dissolve this green precipitate in a very few drops of acetic acid specific gravity 1.04, when the precipitate remaining will be quite red in color, then add about 1 c.c. of acetic acid, and dilute the solution with boiling water, so that the beaker may be about four-fifths full. Heat to boiling, and when the solution has boiled one minute, lower the lamp, filter as rapidly as possible through a 5½-in. filter, and wash once with hot water. The filtrate should run through clear, but in a few minutes it will appear cloudy by the precipitation of the ferric oxide, which has been formed by the exposure of the filtered solution to the air. The points to be observed are the red color of the precipitate, and the clearness of the solution when it first runs through. Ferric phosphate being white, the red color of the precipitate shows that enough ferric salt was present in the solution to form ferric phosphate with all the phosphoric acid, and enough more to color the ferric phosphate red with the excess of ferric oxide. When the precipitate has drained quite dry, pour about 15 c.c. of hydrochloric acid into the beaker in which the precipitation was made, warm it slightly so that the acid may condense on the sides and dissolve any adhering oxide, wash off the cover into the beaker, add about 10 c.c. of bromine water, pour this on the filter containing the precipitate, allowing it to run around the edge of the filter, and let the solution run into a No. 1 Griffin's beaker. Wash out the beaker once or twice, and then wash the filter well with hot water. If the acid in the beaker is not sufficient to dissolve the precipitate completely, drop a little strong acid around the edge of the filter before washing it with hot water. The scaly film of difficultly soluble oxide which sometimes forms on boiling the acetate precipitate is caused by the presence of too much acetate of ammonium, but when the instructions given above are carefully carried out it never appears. Evaporate the solution in the small beaker nearly to dryness to get rid of the excess of hydrochloric acid, add to it a filtered solution of 5 or 10 grammes of citric acid, according to the size of the precipitate of oxide of iron, etc., dissolved in 10 to 20 c.c. of water, then 5 to 10 c.c. of magnesia mixture, and enough ammonia to make the solution faintly alkaline. Stand the beaker in cold water, and, when the solution is perfectly cold, add to it one-half its volume of strong ammonia and stir it well. When the precipitate of ammonio magnesian phosphate has begun to form, stop stirring, and allow it to stand in cold water for 10 or 15 minutes, then stir vigorously several times at intervals of a few minutes, and allow it to stand over night. Filter on a small ashless filter, and wash with a mixture of 2 parts of water and 1 part ammonia, containing 2.5 grammes of nitrate of ammonia to 100 c.c. Dry the filter and precipitate, and ignite them at a very low temperature at first, so as to carbonize the filter without decomposing the precipitate, which may then be readily broken up with a platinum wire. Raise the heat gradually, and

finally ignite at the highest temperature of the Bunsen burner. When the precipitate is perfectly white, cool and weigh. Then fill the crucible half full of hot water, add from 5 to 20 drops of hydrochloric acid, and heat until the precipitate has dissolved. Filter off on another small, ashless filter any silica or oxide of iron that may remain, ignite and weigh. The difference between the two weights is the weight of pyrophosphate of magnesia, which, multiplied by 0.27836, gives the weight of the phosphorus.

Dr. Dudley used the following method:

Start with 10 grammes, and proceed exactly as described by Mr. Blair, up to the point of adding the bromine water. Then, instead of adding a few drops, add enough bromine water to convert $\frac{1}{2}$ gramme of the iron into the sesquioxide. Then make the basic acetate separation as described, except, on account of the large amount of iron, a little ammonium acetate is added. Dissolve the basic acetate, precipitate in moderately strong hydrochloric acid, and evaporate the liquid to dryness, to render any silica present insoluble. Take up with 40 c.c. of strong nitric acid, and evaporate to dryness a second time, to remove the hydrochloric. Then take up with 75 c.c. of dilute nitric acid, 1.13 specific gravity, filter, and precipitate with 75 c.c. of ammonium molybdate solution, made on the formula given in Mr. Shimer's method. Allow to stand at a temperature not above 40° Cent. for 12 hours. Collect the yellow precipitate on a filter, and, after thorough washing, dissolve in 2½ c.c. of strong ammonia diluted with water, and wash thoroughly with water until the total volume of solution amounts to about 100 c.c. Pass hydrogen sulphide until this solution becomes dark red in color. Then render distinctly acid with hydrochloric acid. The hydrogen sulphide readily converts the molybdic acid into molybdenum sulphide in ammoniacal solution, and, if the gas has been passed long enough, a complete separation of the molybdenum results, along with any arsenic that may be present, when the solution is treated with hydrochloric acid in slight excess. Filter off from the molybdenum sulphide, wash thoroughly with water containing a little hydrochloric acid, and evaporate nearly to dryness, in order to have controllable bulk of solution. Then take up with a little water, to which 2 or 3 c.c. of dilute hydrochloric acid has been added, and filter if necessary to remove separated sulphur and a trace of molybdenum sulphide which may separate during the evaporation. Concentrate the filtrate to about 15 c.c., and add 5 c.c. of magnesia mixture and a little ammonia. The total volume of the solution should now not exceed 25 or 30 c.c. From this point on, the process was conducted exactly as described by Mr. Blair.

Dr. Drown used the following method:

Put 2 to 5 grammes of the steel in a 10 to 12-ounce Erlenmyer flask,

and add 75 c.c. of nitric acid, specific gravity, 1.13. When solution is complete, boil one minute and then add 10 c.c. of potassium permanganate solution, 25 grammes to 2 litres of water. Boil until the pink color disappears and binocide of manganese separates, remove from the heat, and then add crystals of ferrous sulphate, free from phosphorus, with agitation until the solution clears up, adding as little excess as possible. Heat the clear solution to 185° Fahr., and add 75 c.c. of ammonium molybdate solution, made as described in Mr. Shimer's method, which is at a temperature of 80° Fahr., close the flask with a rubber stopper, and shake five minutes, keeping the flask so enclosed during the operation that it will lose heat very slowly. Allow it to stand five minutes for the precipitate to settle, and then filter through a 9 cm. filter, and wash with acid ammonium sulphate solution until ammonium sulphide, tested with the washings, shows no change of color. The acid ammonium sulphate solution is made by adding 27½ c.c. of ammonia, 0.96 specific gravity, to ½ litre of distilled water, then adding 24 c.c. concentrated C. P. sulphuric acid, and making up to 1 litre with distilled water. In the foregoing the Pennsylvania Railroad rapid method, as prepared by Dr. Dudley, was strictly followed. It was thought best to do this rather than multiply minor differences in method, although Dr. Drown does not think the use of acid ammonium sulphate has any advantages over acid ammonium nitrate for washing the yellow precipitate, or ferrous sulphate any advantage over tartaric acid as a reducing agent. The yellow precipitate is then dissolved in ammonia (the filter paper should remain perfectly white), and this filtrate precipitated by magnesia mixture. The beaker is allowed to stand in a cold place over night, and the precipitate filtered off and thoroughly washed with a mixture of 1 part ammonia 0.96 specific gravity, 1 part alcohol, and 2 parts water. It is then dissolved in hydrochloric acid, and treated with a current of sulphureted hydrogen for three hours, during which time the solution is repeatedly heated. After filtering off the molybdenum sulphide, a little more magnesia mixture is added to the filtrate, and then ammonia, and the standing, filtration and washing repeated as above. This magnesium ammonium phosphate, freed from molybdic acid and any arsenic which may have been present in the steel, is dried, ignited in a platinum crucible, with the filter paper, with repeated addition of strong nitric acid, the crucible being on its side. After weighing, the magnesium pyrophosphate is heated with dilute hydrochloric acid for some time, and any insoluble matter deducted from the weight of the pyrophosphate.

Mr. Shimer used the following method :

Dissolve 5 grammes of steel in nitric acid, specific gravity 1.20, evaporate to hard dryness on hot plate, dissolve in as little hydrochloric acid as possible, and again evaporate to hard dryness on hot plate.

The reason for this double evaporation to dryness is that a simple baking with nitric acid alone is not enough to insure complete oxidation of the phosphorus in some samples. The second baking with hydrochloric acid insures full oxidation. Now redissolve in hydrochloric acid and filter from silica. Replace hydrochloric acid with nitric acid by evaporation, and precipitate by ammonium molybdate solution, 100 grammes molybdic acid, 400 c.c. ammonia 0.96 specific gravity, and 1 000 c.c. nitric acid 1.20 specific gravity, at about 50° Cent. Filter and wash well with the acid ammonium sulphate solution described in Dr. Drown's method. Dissolve in not too great excess of ammonia, allowing the ammoniacal solution to run into the beaker in which the precipitation was made. In case this solution is not perfectly clear, or in case any insoluble matter remains upon the filter, add a few drops of hydrochloric acid 1.12 specific gravity, and allow the acid solution to run into the ammoniacal solution until the latter becomes slightly acid, throwing down the yellow precipitate. Boil for a few minutes. This boiling seems to decompose certain phosphatic compounds. Now add ammonia in slight excess and boil a few minutes. Filter and wash with hot water. Dissolve the precipitate in a few drops of nitric acid, and precipitate by ammonium molybdate solution. Filter, wash and dissolve in ammonia, the additional yellow precipitate, and add it to the main solution. Add a little hydrochloric acid to the ammoniacal solution, but not enough to render it acid. Precipitate by magnesia mixture with stirring. Filter and wash a few times with dilute ammonia, 1 part ammonia 0.96 specific gravity, to 3 parts water. Redissolve in hydrochloric acid, and let the solution run into the beaker in which the precipitation was made. Add sulphurous acid water, and boil until excess of sulphurous acid is driven off. Now add strong sulphureted hydrogen water, and heat gently until all arsenic and molybdenum are separated as sulphides. Filter and re-precipitate by adding excess of ammonia, and a few cubic centimeters more of magnesia mixture. Filter and wash with dilute ammonia, and weigh as magnesium pyrophosphate.

Mr. Barba used the acetate method as described above by Mr. Blair for sample No. 3, which contains the added arsenic, and for the other four samples the following method.

Weigh 5 grammes into a No. 5 beaker, dissolve in 75 c.c. nitric acid 1.20 specific gravity. When solution is nearly complete, add 5 c.c. concentrated hydrochloric acid, and evaporate on the hot plate to dryness. Roast for about an hour on the hottest part of the plate, cool and redissolve crust with 40 c.c. concentrated C. P. hydrochloric acid and boil. Evaporate to syrup, removing all excess of hydrochloric acid, though retaining enough to keep the liquid acid and clear when diluted. Add 30 c.c. water and filter. To the clear filtrate add 40 c.c. concentrated C. P. nitric acid and boil,

evaporating to syrup to remove all the hydrochloric acid. Cool somewhat and add 25 to 30 c.c. of ammonia, producing some excess of ammonia. Just redissolve the precipitated hydrates with concentrated C. P. nitric acid, using just enough excess to insure freedom from basic iron salts, as will be shown by the liquids assuming a rich clear color. After washing down the sides of the beaker with ammonium nitrate wash water, made by adding to 1 200 c.c. nitric acid 1.20 specific gravity, 400 c.c. of ammonia 0.96 specific gravity, and 400 c.c. of water, the liquid will have a volume of 100 c.c. Heat to 75° Cent. and add 75 c.c. ammonium molybdate solution, place on the stirring machine, and stir vigorously for 10 minutes. The ammonium molybdate solution is made by adding 362 grammes of molybdic acid to 960 c.c. of water, then adding 560 c.c. of ammonia 0.90 specific gravity, and, after solution is complete, adding 240 c.c. of nitric acid 1.40 specific gravity, and then pouring the solution into a mixture of 1 600 c.c. of nitric acid 1.40 specific gravity, with 3 840 c.c. of water. Filter and wash free from iron with the ammonium nitrate solution above described. Then wash thoroughly with ammonium sulphate solution, made by adding to 2 000 c.c. of water 49 c.c. of concentrated C. P. sulphuric acid and 65 c.c. of ammonia 0.96 specific gravity. Dissolve the phospho-molybdate back into the precipitating beaker with warm ammonia specific gravity 0.986, and wash, make up ammoniacal solution to 125 to 150 c.c. with hot water, and add 6 to 9 c.c. sulphuric acid specific gravity 1.58, according to amount of ammonia used. The solution is then passed through a reductor, filled with granulated zinc of 20 to 25 mesh, washed with hot water, and titrated with permanganate of potash. It is assumed in the calculations that the ratio between metallic iron and molybdic acid is as 100 to 90.76, and that the ratio between molybdic acid and phosphorus in the yellow precipitate is as 100 to 1.794.

The magnesia mixture used in the above methods is made by dissolving 66 grammes of crystallized C. P. magnesium chloride, and 168 grammes of C. P. ammonium chloride in 780 c.c. of distilled water, and adding 420 c.c. of C. P. ammonia specific gravity, 0.96. Allow to stand two days and filter.

It is, to say the least, interesting that methods differing so widely in principle, in strength of solutions, and in manipulation, should give results so closely agreeing as the figures show, and it is perhaps not too much to say that with proper care and skill the determination of phosphorus in steel is at present, so far as accuracy is concerned, in a very satisfactory condition. The amount of labor and time required by the various methods given above is, however, too great, and it is hoped that the work of the Subcommittee will result within the next six months in a method which is equally as accurate as those above

described, and which will be very much less laborious, and give results in very much less time.

W. P. BARBA,
A. A. BLAIR,
T. M. DROWN,
P. W. SHIMER,
C. B. DUDLEY, *Chairman*,
Subcommittee.

Approved.

JOHN W. LANGLEY,
Chairman International Committee.

A. E. HUNT,
THOS. RODD,
WM. METCALF,
CHAS. B. DUDLEY, *Chairman*,
Committee American Society Civil Engineers.

REPORT OF THE AWARD OF THE ROWLAND PRIZE 1893-94.

The Board of Censors appointed to award the Rowland Prize for papers published in the *Transactions* of the Society during the year terminating August 1st, 1894, beg to report that they award the prize to Paper No. 617, on "Distinctive Features and Advantages of American Locomotive Practice," by David L. Barnes, M. Am. Soc. C. E.

ROBERT CARTWRIGHT.
SCHUYLER S. WHEELER.
F. COLLINGWOOD.

REPORT OF THE AWARD OF THE NORMAN MEDAL 1893-94.

JANUARY, 1895.

The Committee on the Norman Medal hereby vote that the medal be awarded for the year 1893-94 to A. E. Hunt, for his paper on "A Proposed Method of Testing Structural Steel."

[Signed]

GEORGE F. SWAIN.
ARTHUR PEW.
JOHN C. CHASE.

MEMOIRS OF DECEASED MEMBERS.

JOSEPH P. CARD, Assoc. Am. Soc. C. E.*

DIED OCTOBER 22D, 1894.

Joseph P. Card was born in Painesville, O., on the 2d of September, 1837, and became an Associate of this Society in 1883.

He served his country honorably during the Civil War, having enlisted as a private and been promoted to 1st Lieutenant of Company C, 103d Regiment, of the Ohio Volunteers. He went to St. Louis at the close of the war and engaged in the iron trade, in which he made a fortune. This was subsequently gravely impaired by business reverses, and in 1879 he took up wood preserving by antiseptics as a pursuit likely to bring about important economical results.

When the American Society of Civil Engineers, impressed with the growing scarcity of durable woods, appointed its committee on "the preservation of timber" in 1880, Mr. Card soon came into communication with that committee, and placed at its disposal such information as he had gathered, and the free use of his works at St. Louis to try experiments; for, by that time, he had become interested in the zinc-tannin process of Burnettizing, and had erected a plant where he was treating timber and paving blocks, notably for the St. Louis bridge, on which the results proved to be excellent, "sweet gum" blocks (a most perishable wood) lasting until they were entirely worn out by traffic.

The committee did not avail of Mr. Card's offer to experiment, but it sent a delegate to St. Louis to obtain his data, for he was at that time constantly experimenting, and subsequently took out several patents for improvements in wood preserving which he predicted would prove valuable.

In 1885 he supervised the erection of a wood-preserving plant for the Atchison, Topeka and Santa Fé Railroad at Las Vegas, New Mexico, and in 1886 he removed his own plant to Chicago under a contract with the Chicago, Rock Island and Pacific Railroad, where his work proved so satisfactory that the contract was twice renewed and the works doubled in capacity.

In 1892 Mr. Card's health failed, he was found to have Bright's disease, and knowing that he was doomed, he cheerfully awaited the end. This came October 22d, 1894, when he calmly passed away surrounded by his family.

He was a man of strict integrity, and after his failure in the iron business in St. Louis he paid in full all his debts long after they were outlawed. His success in the wood-preserving business was largely due to the care with which he conducted all the various operations.

* Memoir prepared by O. Chanute, Past President Am. Soc. C. E.

HERBERT ANDREW YOUNG, Jun. Am. Soc. C. E.

DIED DECEMBER 8TH, 1894.

Herbert Andrew Young was born at Chelsea, Mass., July 23d, 1857. He entered the Massachusetts Institute of Technology in 1877, but sickness early in 1881 prevented him from graduating with the class of that year. During the summer of 1880 he was employed temporarily on the Boston and Albany Railroad. In 1881 was chief of party on the Boston and Lowell Railroad in relocating the center line, laying out sidings, etc. In the fall of 1882 he was employed on surveys of lands and yards of the Toledo, Cincinnati and St. Louis Railroad. A year later he became Principal Assistant Engineer on this line, having charge of an examination of the bridges, building a dock, and making plans for station buildings, etc.

During the time the "Clover Leaf" road was in the hands of a receiver, he was in the position of Chief Engineer, and was Assistant in charge of the Western Division on its reconstruction.

In 1887 he went to Mexico and was employed for a time on the Mexican Central Railroad, and for several years he was Superintendent of Transportation on the whole Mexican Central System.

He had been spending several weeks in the North, and arrived in Toledo on Thanksgiving night on a visit to his father-in-law, Judge Pratt, at whose residence he died suddenly of peritonitis. He leaves a wife and one son.

Mr. Young was elected a Junior of the American Society of Civil Engineers on May 7th, 1884.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.
MORSE, CHARLES MILLER.....	1 Erie Co., Bank Bldg., Buffalo, N. Y.....	Jan. 2, 1895
PRICHARD, HENRY SEWALL.....	Engineer New Jersey Steel and Iron Co., Trenton, N. J.....	Jan. 2, 1895

		Date of Membership.
SUNDSTROM, CARL ALFRED.....	444 Main St., Manayunk, Philadelphia, Pa.....	Oct. 3, 1894
WORCESTER, JOSEPH RUGGLES.....	53 State St., Boston, Mass.	Jan. 2, 1895

ASSOCIATE MEMBERS.

BALDWIN, HIRAM ELLSWORTH	166 Sterling Ave., Cleve- land, O.....	Jan. 2, 1895
GRAY, EDWARD, JR.....	Resident Engineer Ohio Southern R. R., Spring- field, O.....	Jan. 2, 1895

JUNIORS.

EVANS, MYRON EDWARD.....	145 Eighth St., Troy, N. Y.	Jan. 3, 1895
FOLGER, EDWARD PELL	80 Quincy St., Brooklyn, N. Y.....	Dec. 4, 1894
GREEN, HOWARD BURKHARDT.....	135 North 15th St., Phila- delphia, Pa.....	Jan. 3, 1895
JACKSON, WILLIAM.....	Beaver Falls, Pa.....	Jan. 3, 1895
MAURICE, ARCHIBALD STEWART.....	Athens, Pa.....	Jan. 3, 1895
McKIBBEN, FRANK PAPE.....	Mass. Institute of Technol- ogy, Boston, Mass.....	Jan. 3, 1895
OLNEY, ROBERT BLUM.....	139 St. Philip St., Charles- ton, S. C.....	Jan. 3, 1895
SMITH, WILSON FITCH.....	36 West 36th St., New York City.....	Jan. 3, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

ARCHER, WILLIAM.....	Division Engineer B. & O. S. W. Ry., Chil- licothe, Ohio.
BARB, C. C.....	The Streator Ry. Co., Streator, Ill.
BISSELL, F. E.....	Chief Engineer U. P., Denver & Gulf Ry., Denver, Colo.
BONZANO, M. F.....	Assistant General Manager South Jersey R. R., Cape May, N. J.
CARR, W. FRANK	Box 4, Salem, Va.
DAVIS, ROB B.....	1213 Filbert St., Philadelphia, Pa.
DENNIS, W. F.....	308 East Clay St., Richmond, Va.
FAIRLEIGH, JAMES A.....	3936 Washington Ave., St. Louis, Mo.
FRAZIER, J. L.....	Supt. Office, Coast Div. S. P. Co., San Fran- cisco, Cal.
GELLETTE, W. D.....	Assistant Engineer S. P. Co., 75 Union Trust Co. Bldg., San Francisco, Cal.

MITCHELL, HENRY	54 Burroughs St., Jamaica Plain, Mass.
MORSE, CHARLES J.	1825 Asbury Ave., Evanston, Ill.
PRINDLE, FRANKLIN C.	Civil Engineer U. S. N., U. S. Navy Yard, N. Y.
RICHARDS, H. T.	1233 S. Olive St., Los Angeles, Cal.
ROTCH, WILLIAM.	53 State St., Boston, Mass.
STEELE, H. M.	Asheville, N. C.
STEVENS, J. F.	Chief Engineer G. N. Ry., St. Paul, Minn.
THOMPSON, BENJAMIN.	Box 89, Highland Park, Tenn.
THOMSON, JOHN.	253 Broadway, New York City.
WARD, CHARLES D.	554 West 142d St., New York City.

ASSOCIATE MEMBERS.

BROWN, R. K., Jr.	Engineer Maint. Way, Richmond Div. P. C. C. & St. L. Ry., Richmond, Ind.
EASBY, M. WARD.	Media, Pa.
MATHEWSON, I.	Deer Plain, Ill.
McKEAN, REGINALD	Choctaw, Oklahoma & Gulf Ry., South Mc- Alester, I. T.
STANFORD, H. R.	207 Niagara St., Buffalo, N. Y.
TEMPLE, J. FRED.	Office Engineer, Choctaw, Oklahoma & Gulf Ry., South McAlester, I. T.
WATSON, WALTER.	Oxford, N. Y.

ASSOCIATE.

LEWIS, F. C.	23 Butler Bldg., Columbus, O.
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JUNIORS.

BELL, G. J.	(Care A. T. & S. F. R. R.), Wyaconda, Mo.
DUSENBERRY, W. L.	220 Tenth St., South Brooklyn, N. Y.
EASTWOOD, JOHN T.	First Assistant Engineer Sewerage Dept., Portsmouth, Va.
FUERTES, J. H.	13 East Ave., Ithaca, N. Y.
JENCKES, L. B.	(Care G. H. Hammond & Co.), Hammond, Ind.
MONCURE, W. A.	Construction Department P. R. R., Delair, N. J.
THOMPSON, M. J.	Waterbury, Conn.
TRIEST, W. G.	J. F. R. Kelly & Co., Havemeyer Building, New York City.
WILKINS, GEORGE S.	21 Garden St., Mt. Holly, N. J.

ADDITIONS TO LIBRARY AND MUSEUM.

- From American Institute of Mining Engineers:
- A Uniform Method for the Assay of Copper Materials for Gold and Silver.
 - Coal Dust as an Explosive Agent.
 - Connecticut Work and Workmen.
 - Does the Vibration of Stamp-Stems Change their Molecular Structure.
 - Early Days of the Iron Manufacture.
 - Further Experiments on Amorphous Gold.
 - Losses of Gold and Silver in the Fire-Assay.
 - Magnesia and Sulphur in Blast Furnace Cinder.
 - Notes on Three Exhibits made at the Bridgeport Meeting.
 - Our Possibilities.
 - Proceedings of the Bridgeport Meeting.
 - Pyrometry and the Heat Treatment of Steel.
 - The Genesis of Ore Deposits.
 - The Inaccuracy of the Commercial Silver Assay.
 - The Taylor Gas Producer.
 - The Mines of the Chalanches, France.
 - The New Mining Law of New York.
 - The Nickel Mine at Lancaster Gap, Pa.
 - The Lead and Zinc Deposits of Missouri.
- From William S. Bacot, New York:
- Permanent Street Improvements in the City of Burlington, Vt.
 - Report of the Vermont Highway Commission, 1874.
- From Balfour, Williamson & Co., N. Y.:
- Proceedings of Manufacturers of Portland Cement, November 12th, 1894.
- From Board of Trustees of the Sanitary District of Chicago:
- Proceedings November 14th, 21st, 28th; December 4th, 5th, 12th.
- From J. J. R. Croes, New York:
- A Letter to the Rapid Transit Commission.
- From Albert B. Drake, New Bedford, Mass.:
- Fifth Annual Report of the Board of Public Works of the City of New Bedford for the year 1893.
- From R. D. Dodge:
- Annual Report of the Chief Engineer and General Superintendent of the Washington Aqueduct, October 1st, 1863.
 - Supplemental Report of the Chief Engineer and General Superintendent of the Washington Aqueduct, February 22d, 1864.
 - Reports on the Washington Canal, 1864, 1868.
 - The Long Bridge and the Improvement of the Harbor of Washington and Georgetown.
 - Bridges Across the Potomac.
 - Report of the Board of Survey on the Improvement of the Harbor of Washington and Georgetown, 1872.
 - Eighth and Tenth Annual Reports of the Brooklyn Park Commissioners, 1867-68; January, 1870.
- Tenth Annual Report of the Board of Commissioners of the Central Park for 1866.
- Patent for the Single Lift-Lock Adapted to the Ship Canal at Niagara Falls.
- Annual Report of the Commissioners on the Troy and Greenfield Railroad and Hoosac Tunnel, 1866.
- Fifth Report of the Annapolis Water Company, February 12th, 1867.
- A Water Supply for the City of Troy, 1872.
- Review of the McAlpine Pumping Machine, recently constructed for the New Bedford Water Works, 1868.
- Report of the Chief Engineer of Providence Water Works, January, 1871.
- Twelfth Annual Report of the Nassau Water Department, January, 1872.
- Nine Reports on the Central Pacific Railroad of California.
- From Theo. N. Ely, Philadelphia, Pa.:
- Exhibit of the Pennsylvania Railroad Company at the World's Columbian Exposition, 1893.
- From E. Gilpin, Jr., Halifax, N. S.:
- The Mineral Development of Nova Scotia.
- From Harvard University, Cambridge, Mass.:
- Catalogue, 1894-95.
- From Rudolph Hering, New York:
- Report of the 27th Exhibition of American Manufacturers. Franklin Institute, 1874.
 - Guide to the Geology of London.
 - A General Account of the Commonwealth of Kentucky.
 - Iron and Steel Exhibition at the Paris Exposition, 1878.
 - The Technologist for 1870.
 - Polk's Directory of the Building Industries of the United States, 1886.
 - Annals of Hygiene 11 numbers. 1886-87.
 - Pittsburgh and Allegheny in the Centennial year.
 - Report of the Board of Experts in Street Paving, Philadelphia, 1834. 8 copies.
 - Report of the Philadelphia Water Supply, made by the Board of Experts, 1883.
 - Annual Report of the Chief Engineer of the Water Department, Philadelphia, 1875, 1878.
 - Report of the Chief Commissioner of Highways, Philadelphia, 1863. 3 copies.
 - Report of the Citizens' Association on the Drainage and Water Supply of Chicago, 1880, 1885.
 - Seventh Annual Report of the Department of Public Works, Chicago, 1882.
 - Reminiscences of the first Railroad over the Alleghenies.
 - The State of the Iron Manufactures in Sweden.
 - Cholera in Europe in 1884. Consular Report.
 - Long and Short Span River Bridges.
 - Elementare Theorie und Berechnung eiserner Dach und Brücken-Construktion.

- The Admiralty Manual of Scientific Enquiry, London, 1859.
 Proceedings Royal Geographical Society, 1871.
 Cohesive Attraction and the Formation of Worlds.
 Chemins de Fer de la Province de S. Paul, Brazil, 1875.
 Report of the Investigating Committee of the Pennsylvania Railroad, 1874.
 Notes on the Water Works of Philadelphia, 1801-15.
 The Legal Protection of the Present Water Supply of Philadelphia.
 Pennsylvania State Board of Health, Report, 1885.
 Ward's Series of Casts and Fossils.
 Report of the Exploration of Parts of Wyoming, Idaho and Montana.
 Memoirs of M. W. Baldwin.
 The State of Wisconsin.
 Fourth Annual Meeting of the American Water Works Association, 1884.
 Description of the International Bridge at Niagara Falls. Toronto, 1873.
 Thirteen Pamphlets on the Troy and Greenfield Railroad.
 Statistical Tables of American Water Works.
 Bericht über die Abtheilung "Bahnbau." Organ für die Fortschritte des Eisenbahnwesens. 5 vols., bd. 3 vols., unbd.
 Pennsylvania Steel Company.
 Annual Report Water Department, Baltimore, 1885.
 Charleston, S. C.: The Centennial of Incorporation, 1883.
 Second and Third Annual Reports of the Commissioner of Fairmount Park, Philadelphia.
 Description of Cast-Steel Works. Fred Krupp.
 Some Properties and Tables of the One-quarter Square of Numbers.
 Lithographs of Asylums and Almshouses in Philadelphia.
 Grundzüge des Ingenieurwesens. 1853.
 Der Maschinenbau. F. Redtenbacher. 1865.
 Neues System für Eisenbrücken grosser Spannwerken.
 Müller's Brückenbaukunde. 98 plates.
 Des Ingenieurs Taschenbuch.
 Bericht über die XIV Versammlung deutsche Architekten und Ingenieure.
 Deutsche Industrie Zeitung. 1865, odd numbers.
 Grundsätze und Erfahrungen in Betreff der verschiedenen Zimmerarbeiten, Leipzigs.
 Handbuch der Ingenieur Wissenschaft.
 Die Mediciner und Verwaltungsbehörden in der Städtereinigungsfrage.
 Wie steht die Städtereinigungsfrage?
 Der Strassen und Eisenbahnbau.
 Stecker's Organische Chemie.
 Stecker's Inorganische Chemie.
 International Exhibition, Philadelphia, 1876.
 Special Catalogue of the Netherlands' Section.
 Swedish Catalogue. 2 parts.
 German Catalogue.
 Department of Arts Catalogue.
 Main Building Catalogue.
 Belgium Catalogue.
 Austrian Department Catalogue.
 British Section Catalogue.
 France. Notice sur les modèles, carte des ponts et chaussées.
 Official Catalogue.
 Ransomes and Rapier, Engineers' Catalogue.
 Fisher's Mathematics Simplified.
 The Divining Rod. Charles Latimer.
 Report on the Water Supply of Philadelphia. 1875.
 Annual Report of the Department for Supplying the City with Water, Philadelphia, 1877, 1879.
 La Scienza et la vita.
 Annual Report of the National Board of Health. 1884.
 Proceedings Engineers' Club of Philadelphia. 1879.
 Transactions of the Sanitary Institute of Great Britain. 2 vols. 1879 and 1880.
 Tenth Annual Report of the Department of Public Works, Chicago. 1880.
 Charleston, 1870-83.
 Black Hills of Dakota. 1874.
 Carroll, Mont., to Yellowstone National Park.
 Tables and Results on the Precipitation in Rain and Snow in the United States 1872.
 Locomotive Engines.
 Popular Treatise on Gems.
 Ponts et Chaussées. Ville de Paris.
 Service des eaux et des égouts.
 Report of the United States Commissioner to the Paris Exposition. 1867. 6 vols.
 Citizens' Memorial on the Water Supply of Philadelphia. 1887.
 From W. H. Jaques, New York, N. Y.:
 The Armor Plate Question. 1894.
 From G. Leverich, Brooklyn, N. Y.:
 Report of the Trustees of the New York and Brooklyn Bridge for the year ending December 1st, 1894.
 From Ernest McCullough, San Francisco, Cal.:
 Public Works: A Treatise on Subjects of Interest to Municipal Officers.
 From Mansfield Merriman, South Bethlehem, Pa.:
 Ten Specimens of Slate.
 From New South Wales Government Board for International Exchanges, Sydney, N. S. W.:
 Seven Colonies of Australasia. 1894.
 From E. P. North, New York:
 Statement and Appendix of the Claim of George Chorpenuing against the United States.
 From North of England Institute of Mining and Mechanical Engineers, Newcastle, Eng.:
 Transactions. Vol. XLIII, Parts V and VI. Vol. XLIV, Part I.
 Annual Report of the Council, 1893-94.
 Report of the Proceedings of the Flameless Explosives Committee.
 From Philosophical Society of Glasgow, Scotland:
 Proceedings. Vol. XXV. 1893-94.
 From H. V. and H. W. Poor, N. Y.:
 Poor's Directory of Railway Officials, November, 1894.

From D. A. Reed, Duluth, Minn.:
Seventh Annual Report of the Board of
Public Works, City of Duluth, Minn.,
for the year ending February 28th, 1894.

From The General Compressed Air Company,
N. Y.:
Rapid Transit in New York.

From Edward Walther, Holyoke, Mass.:
Annual Reports of the City Engineer.
Holyoke, Mass., 1890, 1891, 1892, 1893.

From U. S. War Department, Chief of Engineers:

Fifty-five Reports on the Improvement of
Certain Rivers and Harbors.

Annual Report upon the Improvement of
Chicago and Calumet Harbors, 1894.

Fourteen Specifications for the Improve-
ment of Certain Rivers and Harbors.

From William Watson, Boston, Mass.
International Congress on Water Trans-
portations. Chicago, 1893.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—February, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

FEBRUARY 6TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 51 Members and 7 visitors.

The President announced the election by the Board of Direction, on Tuesday, February 5th, of Charles Warren Hunt, M. Am. Soc. C. E., as Secretary of the Society.

Minutes of the meeting of January 2d, 1895, were read and approved.

Announcement was made that the minutes of the Annual Meeting, January 16th, 1895, being too voluminous to be read at this meeting, would, according to custom, be printed in full in the January number of the *Transactions*, soon to be issued.

Announcement was made of the election by the Board of Direction of the following candidates for Junior membership:

On January 3d, 1895: Myron Edward Evans, Troy, N. Y.; Howard Burkhardt Green, Philadelphia, Pa.; William Jackson, Beaver Falls, Pa.; Archibald Stewart Maurice, Athens, Pa.; Frank Pape McKibben,

Boston, Mass.; Robert Blum Olney, Charleston, S. C.; Wilson Fitch Smith, New York City.

On February 5th, 1895: William Alfred Baehr, Oshkosh, Wis.; James Edwin Boatrite, Brooklyn, N. Y.; Richard Cochran Hanson, Brooklyn, N. Y.; William Carter, Cleveland, Ohio; Nicholas Daubeney Monsarrat, Liverpool, Ohio; George Elbert Nostrand, New York City; Richard Lord Russell, Brooklyn, N. Y.

Ballots were canvassed and the following candidates were declared by the President elected to the grades mentioned:

As Members: Henry Furlong Baldwin, Springfield, Ill.; Freeman Clarke Coffin, Marlboro', Mass.; James Hillhouse Fuertes, Ithaca, N. Y.; Frederick Collamore Hitchcock, Oklahoma City, Okla.; Edward Clinton Terry, Hartford, Conn.

As Associate Members: Harvey Farrington, Croton-on-Hudson, N. Y.; Frederic Charles Kunz, Philadelphia, Pa.; Frank Thompson Oakley, Toledo, O.; John Clarendon McClure, Los Angeles, Cal.; William Boardman Reed, New York City; Chauncey Grant Williams, Pittsburg, Pa.

The special ballot on the reconsideration of the application of Chandler Davis, Jun. Am. Soc. C. E., for Associate Member was canvassed, and the President declared Mr. Davis elected an Associate Member of the Society, under Article III, Sec. 5, of the Constitution.

An abstract of the paper by William Ham. Hall, M. Am. Soc. C. E., on "The Santa Ana Canal of the Bear Valley Irrigation Company," was read by the Secretary, and was discussed by Messrs. W. B. Parsons, Croes, John Thomson, James Duane, Kenneth Allen, A. S. Tuttle, Tribus and Nichols.

On motion of Mr. Croes, duly seconded, further discussion of this paper was postponed, to be taken up at a subsequent meeting.

Adjourned.

FEBRUARY 20TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair, Charles Warren Hunt, Secretary; and present, also, 54 Members and 5 visitors.

A paper on "The Relative Effects of Frost and the Sulphate of Soda Efflorescence Test on Building Stones," by Lea McL. Luquer, Ph. D., was read by the author. A written discussion by Mr. F. Collingwood was then read by the Secretary, and discussion followed by Messrs. Berg, Croes, James Owen and the author.

A paper by C. M. Broomall, Jun. Am. Soc. C. E., on "Static Friction" was then read by the Secretary, as was also a written discussion by Mr. F. Collingwood, and the paper was further discussed by Messrs. John Thomson and William H. Burr.

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract.)

FEBRUARY 5TH, 1895.—Thirteen Members present.

Action was taken in regard to Members in arrears for dues.

The following resignations were presented to the Board and duly accepted: Charles Seymour, M. Am. Soc. C. E.; Alexander Dempster, M. Am. Soc. C. E.; Fred. S. Benson, M. Am. Soc. C. E.

Messrs. Desmond FitzGerald, F. S. Curtis and J. M. Knap were appointed by the President a committee to select the time and place for holding the next Annual Convention.

The following preamble and resolution were adopted:

"Whereas, The Board of Direction of the American Society of Civil Engineers desires to give expression to the appreciation of the Society for the kindness with which its members were received at Willets Point on January 17th, 1895. Be it, therefore,

"Resolved, That the thanks of the American Society of Civil Engineers are hereby heartily tendered to Lieutenant-Colonel W. R. King, Corps of Engineers, U. S. A., and to all the officers of the Post at Willets Point, for the courteous and cordial reception extended to the Society as a body, and to its members individually, and also for the torpedo and mortar firings, the big gun magnet and other exhibits, which proved so exceedingly interesting and instructive;

"Resolved, That the above resolution be properly engrossed and forwarded to Colonel King."

The following applicants were elected as Juniors: William Alfred Baehr, Oshkosh, Wis.; James Edwin Boatrite, Brooklyn, N. Y.; Richard Cochran Hanson, Brooklyn, N. Y.; William Carter, Cleveland, Ohio; Nicholas Daubeney Monsarrat, Liverpool, Ohio; George Elbert Nostrand, New York City; Richard Lord Russell, Brooklyn, N. Y.

Applications for membership were considered and other routine business transacted.

Ballots were canvassed, and Charles Warren Hunt, M. Am. Soc. C. E., was declared elected Secretary of the Society.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.	
COFFIN, FREEMAN CLARKE	53 State St., Boston, Mass.	Feb.	6, 1895
FUERTES, JAMES HILLHOUSE	13 East Ave., Ithaca, N. Y.	May	2, 1888
	N. Y.	Feb.	6, 1895
HITCHCOCK, FREDERICK COLLAMORE	South Me. Alester, Ind. T.	Mar.	7, 1894
		Feb.	6, 1895
TERRY, EDWARD CLINTON	Hartford, Conn.	Feb.	6, 1895

ASSOCIATE MEMBERS.

DAVIS, CHANDLER.....	Dept. of Docks, Pier A, New York City.....	J. Assoc.M.	Dec. 3, 1890 Feb. 6, 1895
GRAVES, EDWIN DWIGHT.....	Assistant Engineer Ber- lin Iron Bridge Co., 713 Bennett Bldg., New York City.....		Jan. 2, 1895
McCLURE, JOHN CLARENDON	Assistant Engineer S. P. Co., Los Angeles, Cal.		Feb. 6, 1895
OAKLEY, FRANK THOMPSON.....	Assistant Engineer T. A. A. & N. M. Ry., Toledo, Ohio.....		Feb. 6, 1895
WILLIAMS, CHAUNCEY GRANT.....	Eleventh and Pike Sts., Pittsburgh. Pa.		Feb. 6, 1895

JUNIORS.

BAEHR, WILLIAM ALFRED.....	Oshkosh, Wis.	Feb. 5, 1895
BOATRUTE, JAMES EDWIN....	20 Clinton Pl., Brooklyn, N. Y.....	Feb. 5, 1895
CARTER, WILLIAM.....	1450 Woodland Hills Ave., Cleveland, Ohio.	Feb. 5, 1895
MONSARRAT, NICHOLAS DAUBENEY....	1863 Pearl St., Cleveland, Ohio.....	Feb. 5, 1895
RUSSELL, RICHARD LORD	255 Schenck St., Brook- lyn, N. Y... ..	Feb. 5, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

ALLEN, KENNETH	Yonkers, N. Y.
ATKINSON, JOHN B.	President and Treasurer St. Bernard Coal Co., Earlington, Ky.
AULLS, HERBERT L.....	705 People's Bank Bldg., Denver, Colo.
BAKER, WILLIAM H.....	Construction Engineer G. B. & K. C. Ry., Beaumont, Texas.
BARNES, DAVID L.....	Consulting Engineer, Suite 1750, Monad- nock Bldg., Chicago, Ill.
BECKLER, ELERIDGE H.	1431 Monadnock Bldg., Chicago, Ill.
BURBANK, GEORGE B.....	Consulting Engineer, Erie Co. Savings Bank Bldg., Room 81, Buffalo, N. Y.
CLAPP, L. RUSSELL.....	Hempstead, N. Y.
CODWISE, EDWARD B.	Engineer U. & D. R. R., Kingston, N. Y.
DANFORTH, FREDERIC	Member State Board of Railroad Commis- sioners, Gardiner, Me.
DOREMUS, A. F.	Chairman Board of Public Works, Salt Lake City, Utah.

DUDLEY, CHARLES B.	Drawer 334, Altoona, Pa.
DUNHAM, H. F.	150 Broadway, New York City.
EARL, GEORGE G.	Chief Engineer New Orleans Sewerage Co., 806 Perdido St., New Orleans, La.
ELLIOTT, CHARLES G.	201 South Jefferson Ave., Peoria, Ill.
FITZGERALD, J. LELAND.	437 State St., Schenectady, N. Y.
FOOTE, ARTHUR D.	Grass Valley, Cal.
GERBER, EMIL.	1742 Monadnock Bldg., Chicago, Ill.
GREENE, EDWARD A.	334 South Water St., Providence, R. I.
HUNT, RANDELL.	530 California St., San Francisco, Cal.
JENNINGS, W. H.	Chief Engineer C. H. V. & A. R. R., 10 Clinton Bldg., Columbus, Ohio.
JEWETT, WILLIAM C.	Chief Engineer C. L. & W. Co., 191 Deni- son Ave., Cleveland, Ohio.
JOHNSON, W. C.	Engineer Niagara Falls Hydraulic Power and Manufacturing Co., Niagara Falls, N. Y.
JUENGST, HENRY F.	(Care Wm. Schroeder), 114 South 8th St., St. Joseph, Mo.
KASTL, ALEX. EDWARD.	Assistant Engineer Sanitary District, 522 Rialto Bldg., Chicago, Ill.
KELLY, JOHN P.	Cronin Bldg., Troy, N. Y.
KINSLEY, THOMAS P.	12 North St., Baltimore, Md.
LATHAM, HARRY H.	197-201 Canal St., Chicago, Ill.
MINTURN, ROWLAND B.	Superintendent Superior Div. C. M. & St. P. Ry., Green Bay, Wis.
MOORE, ROBERT.	Laclede Bldg., St. Louis, Mo.
MORISON, GEORGE S.	Room 1742, Monadnock Bldg., Chicago, Ill.
NEILSON, CHARLES.	Second Assistant Postmaster-General, Washington, D. C.
NEWMAN, ROBERT M.	1617 Main St., East, Jackson, Mich.
NICOLLS, WILLIAM J.	1018 South 49th St., Philadelphia, Pa.
PACKARD, RALPH G.	130 Pearl St., New York City.
PEARSONS, GALEN W.	316 Husted Bldg., Kansas City, Mo.
RIFFLE, ALBERT S.	374 Yamhill St., Portland, Ore.
RISER, K. S.	Room 33, Telephone Bldg., Detroit, Mich.
SHANES, THOMAS P.	Reservoir Park, P. O. Box 515, Louisville, Ky.
STONE, EDWARD HERBERT.	Acting Chief Engineer East Indian Ry., Calcutta, India.
STROBEL, CHARLES L.	1744 Monadnock Block, Chicago, Ill.
STUART, A. A.	Chief Engineer The Wilson & Baillie Mfg. Co., 85-93 Ninth St., Brooklyn, N. Y.
TOMLINSON, ALFRED T.	444 N. Clark St., Chicago, Ill.

ASSOCIATE MEMBERS.

DAVIS, A. P.	U. S. Geological Survey, Washington, D. C.
DUNN, EMMET C.	City Surveyor, Alexandria, Va.

FREEMAN, E. G.....	262 Jersey St., Buffalo, N. Y.
GROVER, ALVA J.....	318 South 15th St., Omaha, Neb.
HAWLEY, WM. CHAUNCEY.....	(Care Robt. Swan), 34 Ohio St., Rooms 11 and 12, Allegheny City, Pa.
MITCHELL, EDWIN.....	Engineer of Sewers, Manchester, Va.
PENNYPACKER, LEVIS P.....	Chief Engineer "El Salto" R. R., Guate- mala.
REYNDERS, J. V. W.....	Engineer in charge Bridge and Construc- tion Dept., Pennsylvania Steel Co., Box 119, Harrisburg, Pa.
SABIN, LOUIS C.....	U. S. Assistant Engineer, Sault Ste. Marie, Mich.
WATSON, WALTER.....	Northampton, Mass.

ASSOCIATES.

PRATT, ROBERT J.....	Greenbush, N. Y.
WALKER, JOHN SHAW.....	(Care W. Shaw), Severn St., Oamam, Otaga, New Zealand.

JUNIORS.

BEARD, E. H.....	P. & R. Depot, Pottsville, Pa.
BOECKLIN, WERNER.....	228 West 38th St., New York City.
COWPER, JOHN W.....	1863 Pearl St., Cleveland, Ohio.
HURTIG, J. B.....	King Bridge Co., Cleveland, Ohio.
KNOWLES, MORRIS.....	Assistant Engineer State Board of Health, Room 140, State Bldg., Boston, Mass.
KONDO, TORAGORO.....	Engineer Bureau, Home Dept., Tokyo, Japan.
MILLER, RUDOLPH P.....	(Care L. I. R. R.), Bridgehampton, N. Y.
NICHOLS, CHARLES H.....	Yale Safe and Iron Co., West Haven, Conn.
POLAND, WILLIAM B.....	Assistant Engineer C. C. C. & St. L. Ry., 26 Fort Wayne Ave., Indianapolis, Ind.
SAX, PERCIVAL M.....	517 West York Life Bldg., Chicago, Ill.
SHREVE, ARTHUR L.....	807 Merchants' National Bank Bldg., Baltimore, Md.
SWEITZER, NELSON B., Jr.....	Water Works Co., San Antonio, Texas.
THROOP, AUGUSTUS T.....	Assistant Engineer Cataract Construction Co., 426 Ferry Ave., Niagara Falls, N. Y.

DEATHS.

CARREL, FREDERICK JANVRIN.....	Elected Member, March 5, 1884; died *
SICKELS, FREDERICK ELLSWORTH....	Elected Member, Jan. 7, 1891; died March 8, 1895.

* Date of death unknown.

ADDITIONS TO LIBRARY AND MUSEUM.

- From American Society of Mechanical Engineers, N. Y.:
Transactions, Vol. XV, 1894.
- From Horace Andrews, Albany, N. Y.:
Annual Report of the City Engineer of Albany, N. Y., for the year ending December 1st, 1894.
- From Astor Library, New York:
Fifty-sixth Annual Report of the Trustees, 1894.
- From Onward Bates, Chicago, Ill.:
An Address to Employes, Chicago, Milwaukee and St. Paul Railway January 16th, 1895.
- From Board of Trustees of the Sanitary District of Chicago:
Proceedings, January 2d, 9th, 16th, 23d, 30th, February 6th.
- From Board of Water Commissioners, St. Paul, Minn.:
Thirtieth Annual Report, December 1st, 1894.
- From Howard A. Carson, Boston, Mass.:
Sixth Annual Report of the Board of Metropolitan Sewerage Commissioners, for the year ending September 30th, 1894.
- From C. Corner, Austin, Tex.:
Third Annual Report of the Railroad Commission of the State of Texas for the year 1894.
- From H. Engels, Dresden, Germany:
Schutz von Strompfeller-Fundamenten gegen Unterspülung.
- From Harvard College, Cambridge, Mass.:
Annual Reports of the President and Treasurer, 1893-94.
- From John B. Hawley, Fort Worth, Tex.:
Report on the Water Supply of Fort Worth, Tex.
- From H. V. Hinckley, Topeka, Kans.:
Proceedings Second Annual Convention Kansas Irrigation Association, November 23d and 24th, 1894.
- From Howson and Howson, N. Y.:
Proceedings and Addresses of the Patent Centennial Celebration of 1891.
- From William Pierson Judson, Oswego, N. Y.:
City Roads and Pavements suited to Oswego, N. Y. (2 copies)
- From George A. Kimball, Boston, Mass.:
Report of the Committee on Drainage of the Town of Milton, Mass., 1895.
- From Massachusetts Institute of Technology, Boston, Mass.:
Annual Catalogue, 1894-95.
Annual Report of the President and Treasurer, December 12th, 1894.
- From Robert Moore, St. Louis, Mo.:
Report to General Reorganization Committee of the Atchison, Topeka and Santa Fé Railroad Company.
- From E. P. North, New York:
President's Annual Message and Annual Reports of the Sanitary District of Chicago.
Report on the Organization, etc., of the Sanitary District of Chicago.
- From Prof. A. Riedler, Berlin, Germany:
Zur Frage der Ingenieur-Erziehung.
- From W. L. Scaife, Pittsburgh, Pa.:
Lake Erie and Ohio River Ship Canal Organization, etc.
- From State Agricultural College, Fort Collins, Col.:
Seventh Annual Report of the Agricultural Experiment Station.
- From State College of Kentucky, Lexington, Ky.:
Catalogue for 1893-1894.
- From Superintendent of Government Printing, Calcutta, India:
Reprint of the Proceedings of the Committee of Locomotive and Carriage Superintendents for India, 1889-93. Vols. I to V, with Index.
Proceedings, Vol. V, 1893.
- From Technical High-School, Berlin, Germany:
Das Gesetz von der Erhaltung der Energie und seine Bedeutung für die Technik.
- From Under Secretary for India, Calcutta, India:
Administration Report on the Railways in India for 1893-94, Part II.
- From U. S. Bureau of Education:
History of Higher Education in Rhode Island.
History of Education in Maryland.
- From U. S. Department of Agriculture, Weather Bureau:
Rainfall and Snow of the United States, Compiled to the end of 1891, with Annual, Seasonal, Monthly and other Charts.
- From U. S. Patent Office:
Alphabetical Lists of Patentees and Inventions for the Quarter ending June 30th, 1894.
- From U. S. Treasury Department, Bureau of Statistics:
Summary Statement of the Imports and Exports of the United States for December, 1894.
- From U. S. War Department, Chief of Engineers:
Forty-seven Specifications for the Improvement of Certain Rivers and Harbors.
- From University of the State of New York:
Seventy-sixth Annual Report of the New York State Library.
- From L. Van Wyck, New York:
Report of the Board of Commissioners of Electrical Subways of the City of Brooklyn, December 31st, 1874.

From Venezuela Society of Civil Engineers,
Caracas, Ven.:

Ofrenda de la Sociedad Venezolana de
Ingenieros Civiles al Gran Mariscal de
Ayacucho en su Centenario. (10
copies.)

From Welton & Bonnett, Waterbury, Conn.:

Twenty-eighth Report of the Board of
Water Commissioners of the City of
Waterbury for year ending December
31st, 1894.

By Exchange:

Eleventh, Twelfth, Thirteenth, Four-
teenth, Fifteenth, Sixteenth, Seven-

teenth and Eighteenth Annual Reports
of the Department of Public Works,
Chicago, 1886 to 1893, inclusive.

By Purchase:

Proceedings of, and Papers Read at, the
Sixth International Inland Navigation
Congress, The Hague, 1894.

Unknown:

Proceedings of the Fourth Annual Meet-
ing of the American International
Association of Railway Superintend-
ents of Bridges and Buildings held in
Kansas City, Mo., October 16th, 17th
and 18th, 1894.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—March, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

MARCH 6TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 76 Members and 6 visitors.

The President announced that the minutes of the meetings of February 6th and 20th had been printed in full in BULLETIN No. 55, as recorded in the minute book, except that in the printed minutes the names of Members and visitors in attendance are omitted.

The reading of the minutes was dispensed with and they were approved.

Messrs. P. F. Brendlinger, A. S. Tuttle and O. E. Hovey were appointed tellers, to canvass the ballot on the amendments to the Constitution.

The following resolution was offered by Mr. Foster Crowell:

Whereas, The State Engineer is now coöperating with the United States Geological Survey in making an accurate topographical map of the State of New York, which will be of great use to engineers and others interested in the development of the State's resources; and as there is now no map of the State which is correct as to position, and no map giving reliable topographical information of any kind; and

Whereas, After full consideration, appropriations for this work have been made by previous legislatures, and a moderate additional yearly amount is required for its prosecution until completion;

Resolved, That it is the sense of this meeting of the American Society of Civil Engineers that the continuation of the present energetic prosecution of the work is desirable and should not be allowed to lapse through lack of sufficient appropriations ;

Resolved, That the Secretary be directed to transmit copies of this resolution to the Governor, Lieutenant-Governor, Speaker of the Assembly, and the Chairman of the Committee of Ways and Means.

The resolution was seconded by Mr. Edward P. North; the question was put and the resolution was declared carried.

The Secretary made the following announcements :

Of the election by the Board of Direction on March 5th, 1895, of the following candidates :

As Juniors : Safford Kinkead Colby, Toledo, O.; Charles Augustus French, Boston, Mass.; Albert Courtney Lewerenz, Rochester, N. Y.; Charles Depew Searle, New York City; Edward Dana Wickes, Chicago, Ill.

Of the death of Frederick J. Carrel, of Spokane, Wash.; elected Member March 5th, 1884.

That the Board of Direction had decided that the Annual Convention of 1895 shall be held at the Hotel Pemberton, in Boston Harbor, beginning June 18th.

Ballots were canvassed, and the following candidates were declared by the President elected to the grades mentioned :

As Members : George Gibbs, Milwaukee, Wis.; Thomas Chalkley Hatton, Wilmington, Del.; Alexander Crombie Humphreys, New York City; Albert William Johnston, Cleveland, O.; Francis Denis Hubert Lawlor, St. John, N. B.; De Courcy May, Niagara Falls, N. Y.; Peter Elbert Nostrand, New York City; Nathaniel Turner, Monterey, Mexico.

As Associate Members : William Ethelbert Belknap, Altoona, Pa.; George Lyon Christian, Yonkers, N. Y.; Henry Fitch Coleman, Cincinnati, O.; Eugène Lentilhon, New York City; Francis Winthrop Scarborough, Hinton, W. Va.; Arthur Cornwallis Wheatley, Zanzibar, East Africa.

A paper by Franklin Riffle and Albert S. Riffle, Members Am. Soc. C. E., on "A Line of 28-In. Cast-Iron Submerged Pipe Across the Willamette River, at Portland, Ore.," was read by the Secretary, as were also written discussions on the paper by Messrs. John F. Ward and James Duane. The paper was further discussed orally by Messrs. E. Kuichling, T. H. McCann, J. J. R. Croes, L. L. Tribus, Charles E. Emery, Foster Crowell, O. F. Nichols, E. Sherman Gould and Frank W. Skinner.

The report of the tellers appointed to canvass the ballot on the following proposed amendments to the Constitution was read by the Secretary:

ARTICLE III.

A. 3. Strike out the words "references or endorser," in the sixth line, and substitute the words: "references in the case of Corporate Member, and endorsers in the case of Associate, Junior or Fellow."

ARTICLE III.

B. 5. Strike out all the section after the sentence, "If the Board decides that the reasons for a reconsideration are sufficient, it shall order another ballot to be taken," and substitute the following: "A letter ballot, in a form to be prescribed by the Board, shall then be mailed to each Corporate Member whose address is known. Each ballot shall be signed by the Member who votes it. The returns shall be canvassed by the Board, at a meeting to be held not less than 20 days after the blank ballots shall have been mailed by the Secretary."

"Negative votes to the number of 10% of those cast shall exclude. In case of exclusion, no notice thereof shall be entered in the minutes, but the candidate shall be notified."

"The request for reconsideration of a ballot must be presented within one year after the date of the original canvass of such ballot."

ARTICLE VII.

C. Strike out the whole of the present article and substitute the following:

" 1. The Board of Direction shall, from time to time, divide the territory occupied by the membership into seven geographical districts, to be designated by numbers. District No. 1 shall be the territory within 50 miles of the Post Office in the City of New York. Each of the other six districts shall be, as nearly as practicable, contiguous territory; each shall contain, as nearly as practicable, an equal number of members, and they shall be designated as Districts Nos. 2, 3, 4, 5, 6 and 7. The Board shall announce such division to the Society on or before the first day of May in each year.

" 2. At the Business Meeting of the Annual Convention of each year, seven Corporate Members, not officers of the Society, one from each of the geographical districts, shall be appointed by the meeting, to serve for two years, who, with the five living last Past-Presidents of the Society, shall be a Committee to nominate officers for the Society. The Board of Direction may prescribe the mode of procedure for appointing this Committee. This Committee shall present to the Board of Direction, on or before the first day of October next ensuing, a list of nominees for the offices to be filled at the next Annual Election. The nominees shall be so chosen as to provide, with the officers holding over, a Vice-President and six Directors residing in District No. 1, and 12 Directors divided equally, with regard to number and residence, among the remaining districts, Nos. 2, 3, 4, 5, 6 and 7.

" 3. Directly after the first of October the aforesaid list of nominees shall be mailed to every Corporate Member whose address is known, provided that if any person shall be found by the Board of Direction to be ineligible for the office for which he is nominated, or should a nominee decline such nomination, his name shall not be sent out, but the Board shall substitute another name therefor. The Board shall also fill any vacancies that may occur in this list of nominees up to the time the ballots are sent out. Vacancies must be so filled as to preserve the geographical distribution of officers prescribed in Section 2 of this article.

" 4. At any time before the first day of December any 10 or more Corporate Members may send to the Secretary additional nominations, signed by such Members; but nominations so made must comply with Section 2 of this article, regarding the distribution of nominees among the several districts.

" 5. At least 30 days before the Annual Meeting there shall be mailed to every Corporate Member, whose address is known, a letter-ballot with envelopes for voting. This ballot shall include all the nominations made in accordance with this article. The names and residences of the nominees, their grades of membership, and, in the case of nominees for Directors, the number of the district in which they reside, shall be given. The names of the nominees for any one office shall be arranged alphabetically without distinguishing marks of any kind other than the designations named herein.

" Voters may erase names from the printed ballot-list and may substitute the name or names of any other person or persons eligible for any office. But the number of names for each office on the ballot voted must not exceed the number to be elected at that time to such office, and the vote must be for the proper number of officers, resident in each of the seven districts. Ballots not complying with these provisions shall be rejected.

" Directions in accordance with these provisions shall be issued with the ballots.

" 6. Ballots may be sent by mail to the Secretary, or may be presented to him at the Society House. They must be enclosed in two sealed envelopes, and the outer envelope shall be endorsed by the voter's signature.

" The Secretary shall make from the signatures on the outer envelopes a list of the voters from whom ballots are received, which list shall be open to inspection by all Corporate Members. A voter may withdraw his ballot, and may substitute another, at any time before the polls close.

" 7. The polls shall be closed at 12 o'clock noon on the first day of the Annual Meeting, and the ballots shall be canvassed publicly by tellers, who shall be appointed by the presiding officer.

" The persons of each district who shall receive the highest number of votes for the office for which they are candidates shall be declared elected.

" In case of a tie between two or more candidates for the same office, the Annual Meeting shall elect the officer from among the candidates so tied.

" The presiding officer shall announce to the meeting the names of the officers elected, in accordance with this section."

ARTICLE VI.

D. Amend Section 5 of Article VI by striking out the entire section, reading as follows: "An Assistant Secretary, who shall also be Librarian, shall be appointed by the Board of Direction, and shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society," and substituting the following: "The Board of Direction may also, if they deem it necessary, appoint an Assistant Secretary, who shall aid the Secretary and be under his immediate direction in all matters. His whole time shall be given to the Society."

REPORT OF TELLERS.

VOTE ON AMENDMENTS.

Total ballots received.....	292
Not entitled to vote.....	2
Without signatures.....	3
Blank ballots.....	2
Voted and counted.....	285
	— 292

Amendment A.....	Yes, 265	No, 14—279
“ B.....	“ 224	“ 61—285
“ C.....	“ 273	“ 12—285
“ D.....	“ 273	“ 7—280

P. F. BRENDLINGER.

A. S. TUTTLE.

O. E. HOVEY.

The President announced as the result of the canvass that the proposed amendments to Section 3 of Article III, to Section 5 of Article III, to Article VII, and to Section 5 of Article VI, are adopted, two-thirds of all the ballots cast being in each case in favor of these four amendments, and that under the provisions of the Constitution (Art. IX, Sec. 5) they will take effect on the 5th of April, 1895.

Adjourned.

MARCH 20TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 74 Members and 16 visitors.

Herbert M. Wilson, M. Am. Soc. C. E., addressed the Society on "The Topographic Survey of the United States," the address being illustrated by lantern slides.

The subject was discussed informally by Messrs. James Duane, Kenneth Allen, R. S. Buck, T. C. Clarke, James Owen, F. C. Prindle, R. L. Harris and H. M. Wilson.

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract.)

MARCH 5TH, 1895.—Nine members present.

The time and place for holding the Annual Convention were considered, and Tuesday, June 18th, was designated as the first day of the Convention, and the Hotel Pemberton, at Nantasket, in Boston Harbor, as the place.

The President was requested to appoint a Local Committee of Members of the Society in Boston to assist the Committee of Arrangements already appointed by the Board.

The following geographical districts for the purposes of the Nominating Committee for this year were fixed.

District No. 1.—The territory within 50 miles of the Post Office, in the City of New York.

District No. 2.—The remainder of the State of New York, and New Jersey and Canada.

District No. 3.—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, and all foreign countries.

District No. 4.—Pennsylvania, Delaware, Maryland and the District of Columbia.

District No. 5.—Michigan, Ohio, Indiana, Illinois and Wisconsin.

District No. 6.—Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Washington, Montana, Wyoming, Idaho, Colorado, Utah, Oregon and Nevada.

District No. 7.—Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Florida, Texas, Tennessee, Kentucky, Indian Territory, Oklahoma; New Mexico, Arizona, Arkansas and California.

The President was authorized to select two Members who, with the Secretary, shall constitute the Committee on the Award of the Collingwood Prize for Juniors for 1894.

The following candidates were elected as Juniors: Safford Kinkhead Colby, Toledo, Ohio; Charles Augustus French, Boston, Mass.; Albert Courtney Lewerenz, Rochester, N. Y.; Charles Depew Searle, New York City; Edward Dana Wickes, Chicago, Ill.

Applications were considered and other routine business transacted.

MEMOIR OF DECEASED MEMBER.

SAMUEL LIGHTFOOT SMEDLEY, M. Am. Soc. C. E.*

DIED JULY 21ST, 1894.

Samuel Lightfoot Smedley was born at Edgemont, Delaware County, Pa., December 29th, 1832; died at Philadelphia, July 21st, 1894. He was a descendant from George Smedley, of Derbyshire, England, who came to America in 1682, with other followers of William Penn, and settled 1 mile west of the present town of Media, Pa. Here Samuel L. Smedley, the father of Mr. Smedley, was born,

* Memoir prepared by G. S. Webster and Russell Thayer, Members Am. Soc. C. E.

but died at the early age of thirty-six, when the subject of our memoir was but two years of age. His education and early training therefore devolved upon his mother. As a lad he inherited the mental tastes and strong characteristics of his parents, and developed in his early youth a talent for mathematics. He received his early education at the Friends' Academy, Westtown, Pa., and at a classical school in Germantown. At the age of twenty-one he came to Philadelphia, where, under the instruction of Joseph Fox, a noted surveyor, he became an expert draughtsman. Being a superior mathematician, he made rapid progress as a surveyor and engineer.

In 1856 he plotted the district of West Philadelphia into streets, and soon after published the first complete atlas of Philadelphia, which became the standard for many years. From 1858 to 1872 he was a member of the Board of City Surveyors, and from 1872 until his resignation, in 1893, he filled the responsible position of Chief Engineer and Surveyor of Philadelphia.

By reason of his large experience during so long a period, his services were, necessarily, of great value to the city, which embraces within its corporate limits 129 sq. miles. The improvements and constructions prosecuted by Mr. Smedley cost many millions of dollars, and, among other works, included the building of the Penrose Ferry Bridge; the iron cantilever bridge at Market Street; the Fairmount Bridge; the new Walnut Street Bridge, the ironwork of which is 2 400 ft. long, and the Girard Avenue Bridge. All these cross the Schuylkill River, but in the list of his constructions are numerous bridges crossing smaller streets, canals and railroads. The Girard Avenue Bridge is of iron, is 100 ft. wide, 1 000 ft. long, and cost \$1 500 000. The city of Philadelphia is intersected by many railroads, in laying out which and in making adjustments to avoid grade crossings in the original locations, Mr. Smedley acquired a great reputation for proficiency, and, by his determination, secured a safe and grand entrance to Fairmount Park, by tunneling the railroad at the Green Street entrance. Largely under his direction, 476 miles of sewers were built, including Cresheim Creek Aqueduct, with the extraordinary span of a 116-ft. stone arch. He raised the grade of Market Street west of the Schuylkill River, obliterating a valley with steep ascents and descents, and brought the beautiful part of West Philadelphia within easy reach of the center of the city. Mr. Smedley visited the large cities of Europe in 1865, and was forcibly impressed with the value of their public parks. Soon after his return, with other persons he advocated the establishment of a park for Philadelphia. The result was the purchase from the Barings of England of 150 acres, known as "Lansdowne," along the Schuylkill. This became the nucleus of the famous West Fairmount Park. He made the original surveys; was instrumental in securing George's Hill, with its

commanding view of the city; designed and laid out many of the walks and drives, and from 1872 to 1893 was, *ex officio*, a member of the Board of Park Commissioners.

During the 35 years which Mr. Smedley was connected with the Department of Surveys, he secured and preserved the scattered and rapidly perishing records of the old branches of the city government, a task for which few were better equipped by nature and education than himself, and a labor congenial to one of antiquarian tastes. To his diligence and care the city owes it that the Bureau of Surveys to-day is rich in valuable books, papers, plans and records.

Mr. Smedley, in addition to being a member of the American Society of Civil Engineers, was also a member of the Engineers' Club of Philadelphia, a member of the Historical Society of Pennsylvania since 1857, and its recording secretary for 14 years. He was also a member of the Antiquarian Society, Academy of Natural Sciences, Franklin Institute, West Philadelphia Institute, Delaware County Institute of Science, the Union League of Philadelphia, and the American Public Health Association.

It is much to have passed 35 years as a public official, and to leave behind a character for ability, integrity, sincerity and kindness, such as remains attached to the name of Samuel L. Smedley.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.
GIBBS, GEORGE.....	Mechanical Engineer, Chicago, Milwaukee and St. Paul Ry.; Mil- waukee, Wis.....	March 6, 1895
HATTON, THOMAS CHALKLEY.....	Engineer in Charge of Sewers, Wilmington, Del.....	March 6, 1895
HUMPHREYS, ALEXANDER CROMBIE..	64 Broadway, New York City.....	March 6, 1895
JOHNSTON, ALBERT WILLIAM	General Superintendent New York, Chicago and St. Louis Ry., Cleve- land, O.....	March 6, 1895
LAWLOR, FRANCIS DENIS HUBERT ..	St. John, N. B.....	{ J. Oct. 6, 1886 M. March 6, 1895

MARCH PROCEEDINGS.

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MAY, DE COURCY.....	20 Mt. Vernon Place, Baltimore, Md.....	March 6, 1895
OTAGAWA, MASAYUKI.....	Ashio Copper Mines, Shimotsuke, Japan...	Jan. 2, 1895
PIERCE, HENRY.....	Hinton, West Va.....	Dec. 5, 1894
SHAW, SUMNER FARNHAM.....	Locating Engineer Gov- ernment Railways, Puerto Barrios, Guate- mala.....	Oct. 3, 1894
TURNER, NATHANIEL.....	Chief Engineer Mon- terey & Mexican Gulf Ry., Monterey, Mexico	March 6, 1895

ASSOCIATE MEMBERS.

BELKNAP, WILLIAM ETHELBERT...	Yonkers, N.Y. { J. March 31, 1891 Assoc. M. March 6, 1895
CHRISTIAN, GEORGE LYON.....	82 Maple Ave., Yonkers, N. Y..... March 6, 1895
KUNZ, FREDERICK CHARLES.....	Bureau of Surveys, City Hall, Philadelphia, Pa. Feb. 6, 1895
SCARBOROUGH, FRANCIS WINTHROP..	Assistant En- gineer Main Way, C. & { J. Sept. 3, 1890 O. R. R., Assoc. M. March 6, 1895 Hinton, W. Va..... }

JUNIORS.

COLBY, SAFFORD KINKEAD.....	Care Division Engineer L. S. & M. S. Ry., To- ledo, O..... March 5, 1895
HEDRICK, IRA GRANT.....	Keith and Perry Build- ing, Kansas City, Mo.. Oct. 3, 1893
HORTON, THOMAS OSBORN.....	138 West 42d St., New York City..... Dec. 4, 1894
NOSTRAND, GEORGE ELBERT.....	302 West 118th St., New York City..... Feb. 5, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

CAMPBELL, H. H.....	Superintendent Pennsylvania Steel Co., Steelton, Pa.
CHASE, JOHN C.....	Superintendent and Engineer, the Claren- don Water Works Co., Wilmington, N. C.
FLAD, EDWARD.....	Civil and Mechanical Engineer, 118 La- clede Building, St. Louis, Mo.

FORCE, C. G.	The Livingston, Cleveland, O.
GAHAGAN, WALTER H.	Engineer and Superintendent for Contractors South Canadian River Bridge, 416 American Bank Building, Kansas City, Mo.
HILBERT, H. J.	165 Prospect Ave., Milwaukee, Wis.
MAYER, JOSEPH.	112 Madison Ave., New York City.
PASCHKE, THEODORE.	(Care R. J. Wittig & Co.), Guatemala City, Guatemala.
PETRY, ALFRED.	1001 Scott St., Covington, Ky.
PRINDLE, FRANKLIN C.	Civil Engineer U. S. N., U. S. Navy Yard, Norfolk, Va.
QUINTUS, J. C.	U. S. Assistant Engineer, 121 Franklin St., Buffalo, N. Y.
ROOD, H. M.	170 Stevens Ave., Mt. Vernon, N. Y.
SCHAUB, J. W.	Hamilton Bridge Co., Hamilton, Ontario, Canada.
TALCOTT, T. M. R.	Bon Air, Va.
WAIT, JOHN C.	Mitchells St., Norwich, N. Y.
YEATMAN, POPE.	216 Carondelet St., New Orleans, La.

JUNIOR.

BOATRITE, JAMES E.	70 Clifton Place, Brooklyn, N. Y.
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FELLOW.

HARRISON, S. A.	484 West End Ave., New York City.
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ADDITIONS TO LIBRARY AND MUSEUM.

From Alabama Industrial and Scientific Society:

Proceedings, Vol. IV, No. 2, 1894.

From American Institute of Mining Engineers:

Aluminium Bronze.
A Water-Cooling Apparatus.
Biographical Notice of J. H. Bramwell.
Cinnabar in Texas.
Coal Dust as an Explosive Agent.
Close Sizing Before Jigging.
Early Days of the Iron Manufacture.
Further Experiments for Determining the Fusibility of Fire-Clays.
Iron Ores of East Texas.
Magnesia and Sulphur in Blast-Furnace Cinder.
Nickel and Nickel Steel.
North Carolina Mouazite.
Note on a Proposed Scheme for the Study of the Physics of Cast Iron.
The Genesis of Ore Deposits.
The Inaccuracy of the Commercial Assay for Silver.

The Lead and Zinc Deposits of Missouri.
The Dikes and Reefs of Bendigo.
The Nickel Mine at Lancaster Gap, Pa.
The Tin Deposits of Durango, Mexico.
The Nomenclature of Zinc Ores.
The White Phosphates of Tennessee.

From American Water Works Association, New York:

Proceedings of the Fourteenth Annual Meeting, held at Minneapolis, Minn., 1894.

From Hon. John Bogart, New York:

Note sur l'application des Chemins de Fer économiques à l'achèvement du Réseau des Chemins de Fer Français.
Considerations sur la Substitution des Traverses Métalliques aux Traverses en Bois dans les Voies ferrées.
Notice sur la vie et les travaux de M. Malézieux.
Mémoires publiés à l'occasion du Congrès International de Navigation Intérieure tenu à Bruxelles du 24 Mai au 2 Juin, 1885.

- Guide Programme du premier Congrès International de Navigation Intérieure qui se tiendra à Bruxelles du 24 Mai au 2 Juin, 1885
- From Henry T. Bovey, Montreal, Canada: The Strength of Canadian Douglas Fir, Red Pine, White Pine and Spruce.
- From British Association for the Advancement of Science, London, England: Report of the Sixty-fourth Meeting, 1894.
- From Case School of Applied Science, Cleveland, Ohio: Annual Catalogue, 1894-95.
- From City of Toronto, Canada: Proceedings of the Deep Waterways Convention, held at Toronto, September 17-20th, 1894.
- From Theodore Cooper, New York: General Specifications for the Construction of a Stiffened Suspension Bridge over the Hudson River at New York City.
- From Connecticut State Board of Health, New Haven, Conn.: Seventeenth Annual Report for the year ending December 31, 1893.
- From H. T. Douglas, Baltimore, Md.: Report of the City of Baltimore Topographical Survey for the fiscal year ending December 31st, 1894.
- From Chas. W. Gay, Lynn, Mass.: Annual Report of the City Engineer of the City of Lynn for the year ending December 31st, 1894.
- From Geo. S. Greene, Jr., N. Y.: An Argument made by Mr. George Ticknor Curtis in behalf of the New York City Central Underground Railway Company in opposition to the Beach Pneumatic Bill, 1872.
- Incorporation of the New York City Central Underground Railway Company. Passed April 17th, 1883.
- Report of the Chief Engineer of the Croton Aqueduct Department in answer to a Resolution relative to the Underground Railroad in Broadway, N. Y., 1866.
- The Broadway Underground Railway, Charter of 1873.
- Elevated Margin Steam Railroad.
- Rapid Transit in the City of New York. Laws of 1875.
- Report of a Special Commission to Ascertain the Best Means for the Transportation of Passengers in the City of New York, 1867.
- The Broadway Underground Railway, N. Y., Memorial 1874.
- The Charter of the City of New York, 1857.
- An Act to Reorganize the Local Government of the City of New York. Passed April 30th, 1873.
- Particulars of Construction and Estimate for a plan of the Central Park.
- Communication relative to the improvement of the Sixth and Seventh Avenues from the Central Park to the Harlem River.
- Description of a Plan for the Improvement of the Central Park, 1868.
- Communication on the Subject of Improvements in Westchester County and its Connection with the City of New York by Bridges or Tunnels.
- Annual Reports of the Commissioners of Central Park, 1st, 2d, 3d, 5th, 7th, 9th, 11th and 14th.
- Report of a Special Committee of the Commissioners of Fairmount Park upon the Preservation of the Purity of the Water Supply, 1867.
- Reports of Committee and Engineers on proposed Providence Water Works, August 8th, 1863.
- Fall of the Pemberton Mill.
- Report on Tidal Investigations in Mystic River and Pond.
- Report in Respect to the Drainage of the Back Bay, 1850.
- Report of Experiments on Gunpowder in 1845-47 and 1848.
- Report on Pacific Ocean Telegraphs.
- A Plan for laying Sewer, Water and Gas Pipes.
- Description of a New System of Locomotive Engines.
- Relative Efficiency of Compound and Simple Expansive Engines for Mill Purposes.
- Annual Report of the Board of Harbor Commissioners, Boston, for the Year 1877.
- Reports of the Water Commissioners of Hoboken and Jersey City, 1852, 1862, 1863.
- Report of the Joint Standing Committee on Boston Harbor for the Year 1852.
- Reports on the Water Supply of New York and Brooklyn, 1870.
- Report on the Water Supply from Upper Mystic Pond for Charlestown (Mass.), July, 1862.
- Special Report of the United States Commissioners on Boston Harbor, on the relation of Mystic Pond and River to Boston Harbor, 1861.
- From Rudolph Hering, New York: Water Purification.
- From Alfred Hölder, Vienna, Austria: Oesterreichische Monatschrift für den öffentlichen Baudienst, January, 1895.
- From Holly Manufacturing Company, Lockport, N. Y.: Illustrated and Descriptive Catalogue of High Duty Pumping Engines.
- From Hubert Howson, New York: Contributory Infringement of Patents.
- From Iron and Steel Institute, London, England: Journal, Vol. II, 1894.
- Brief Index of Papers, 1869-1894.
- From W. H. Jaques, New York: The Manufacture of Heavy Ordnance and Armor; their Ballistics and Resistance.
- The Engineering Record, February 20th, 1895.
- From l'Association Amicale des Anciens Elèves de l'Ecole Centrale des Arts et Manufactures, Paris, France: Annuaire 1832-1894.
- From Maine State College, Orono, Me.: Annual Report for the year 1893.
- From Marsden Manson, San Francisco, Cal.: Report of the Commissioner of Public Works to the Governor of California, with Accompanying Maps, 1894.

From Massachusetts State Board of Health,
Boston, Mass.:
Report upon a Metropolitan Water Supply.

From Metropolitan Telephone and Telegraph
Company, N. Y.:
Argument of Gen. Benjamin F. Tracy
against the Gerst-Persons Telephone
Bill.

From Edward P. North, New York:
The Nicaragua Canal; its Political Relations
and Commercial Advantages.

From George W. Rafters, Rochester, N. Y.:
The Application of Intermittent Filtration
to Domestic Filters.

From Railroad Commissioners of the State of
Maine:
Thirty-sixth Annual Report, 1894.

From Société des Ingenieurs Civil de France,
Paris, France:
Annuaire de 1895.

From State Geologist, Trenton, N. Y.:
Four Maps of the Geological Survey of
New Jersey.
Annual Report of the State Geologist for
the year 1893.

From U. S. Navy Department:
Astronomical Papers Prepared for the
Use of the American Ephemeris and

Nautical Almanac, Vol. V, Parts III,
IV.

From U. S. Patent Office:
Annual Report of the Commissioner of
Patents for the year 1893.

From U. S. Treasury Department:
Immigration and Passenger Movement
at Ports of the United States during
the year ending June 30th, 1894.
Statistical Abstract of the United States,
1894.

The Foreign Commerce and Navigation
of the United States for the year ending
June 30th, 1894.

From U. S. War Department, Chief of Engineers:

Thirty-one Specifications for the Improvement
of Certain Rivers and Harbors.

Thirty-eight Reports on Surveys of Certain
Rivers and Harbors.

From University of Pennsylvania, Philadelphia, Pa.:

Catalogue, 1894-95.

Unknown:

Moyens Physiques de l'Action Éloignée.
Résumé d'un Mémoire sur l'Action
Éloignée.

Action Éloignée, Action sur les Mouvements
locaux et généraux de la Terre
retournement de la Terre.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—April, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

APRIL 3D, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary, and present, also, 89 Members and 23 visitors.

The reading of the minutes of the meetings of March 6th and March 20th was dispensed with, and they were adopted as printed in BULLETIN No. 57.

The following preamble and resolutions, offered by Foster Crowell, M. Am. Soc. C. E., were duly seconded, and the resolutions declared carried:

Whereas, It is understood that an effort is being made looking towards discontinuing the Weather Bureau of the State of New York; and,

Whereas, The cost of this Bureau is so small as to be entirely disproportionate to the importance of the work performed and to the value of this work to the citizens of New York;

Resolved, That this meeting of the American Society of Civil Engineers desires to place on record an expression of its sense of the value of the work accomplished by such Weather Bureau, and its strong belief that the present energetic and economical management of this Bureau should not be discontinued;

Resolved, That a copy of this resolution be sent to the Governor, Lieutenant-Governor and Chairman of the Committee of Ways and Means of the Assembly.

The Secretary announced the death of Frederick E. Sickles, Member of the Society, elected January 7th, 1891; died March 8th, 1895.

H. H. Campbell, M. Am. Soc. C. E., presented a paper on "Specifications for Structural Steel." Written discussions by Messrs. Alfred E. Hunt, George A. Lund and Samuel T. Wagner were then read by the Secretary, and the paper was further discussed by Messrs. Gus. C. Henning, Frederick H. Lewis, and the author.

The report of the Committee "On Uniform Methods of Testing Materials Used in Metallic Structures, and on Requirements for These Materials to Further Improve the Grade of Such Structures," which, in conformity with a resolution passed by the Annual Meeting, had been set down for discussion in connection with Mr. Campbell's paper, was discussed by Messrs. J. G. Dagron, William H. Burr, Henry B. Seaman and H. H. Campbell.

Ballots were canvassed, and the following candidates were declared elected to the grades mentioned:

As Members: Gunvald Aus, Washington, D. C.; Frederick William Cappelen, Minneapolis, Minn.; Edgar Sutton Dorr, Boston, Mass.; Frank Bierce Maltby, Uvalde, Tex.; William Gunn Price, Sioux City, Ia.; Henry Beecher Wood, Boston, Mass.

As Associate Members: John Innevarity Boggs, Houston, Tex.; Eugene Willett Van Court Lucas, Wilmington, N. C.; Philo Sackett Perkins, Providence, R. I.

Adjourned.

APRIL 17TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary, and present, also, 59 Members and 10 visitors.

The Secretary presented a paper by John W. Hill, M. Am. Soc. C. E., on "Bacteria and Other Organisms in Water," and also read written discussions on the paper by Messrs. Albert S. Riffle, Allen Hazen, Desmond FitzGerald, Charles W. Sherman, Dr. Adolph Gehrmann, George W. Fuller and George W. Rafter.

The paper was then further discussed by Messrs. Foster Crowell, Charles E. Emery, Robert L. Harris, Rudolph Hering, A. A. Breneman and H. F. Dunham.

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract.)

APRIL 2D, 1895.—Eleven Members present.

Arrangements for the Annual Convention were considered.

It was resolved that a cordial invitation be sent to the Boston Society of Civil Engineers to attend the Annual Convention, stating that it would give great pleasure to this Society if the Boston Society will co-operate in any way with the Local Committee of Arrangements.

Messrs. F. Collingwood, M. Am. Soc. C. E., and W. F. Whittemore, Assoc. M. Am. Soc. C. E., were appointed to serve with the Secretary on the Committee to Award the Collingwood Prize for Juniors for the year 1894.

Applications were considered and other routine business transacted.

APRIL 30TH, 1895.—Ten Members present.

A form of Special Reconsideration Ballot, required under Art. III, Sec. 5 of the Constitution, was adopted.

The following circular was adopted for publication in the BULLETIN, to be hereafter sent to all applicants for membership and to all Members to whom they refer :

*To Members of the American Society of Civil Engineers,
and to Applicants for Membership therein :*

From time to time the Board of Direction finds it necessary to classify an applicant for membership in the Society in a grade below that for which he applies. Much the most frequent reclassification is from the grade of Member to that of Associate Member. It seems well, therefore, to call attention to the differences in the constitutional requirements for the two grades of Corporate Membership, and to the principles controlling the Board in interpreting these provisions of the Constitution.

Concerning certain qualifications there can be no question ; they are mere matters of fact. The minimum age limit is—

For Members.....	30 years.
For Associate Members.....	25 “
The required time of active practice is—	
For Members.....	10 years.
For Associate Members.....	6 “

The time value given to graduation from a technical school is two years in each case.

The requirements that involve interpretation are : For Member one “shall have had responsible charge of work for at least five years, and shall be qualified to *design as well as direct* engineering work.” For Associate Member one “shall have had responsible charge of work as principal or assistant for at least one year.”

It is often difficult to decide whether or not a man has had “responsible charge” for five years ; and whether or not he is “qualified to design.” The fact is that in these qualifications the two grades merge into each other insensibly, and there must be close cases.

In general terms it may be said that :

“Responsible charge” is held to mean the direction of work under such circumstances that one may be called on to use skill and judgment in meeting unforeseen conditions. This is an elastic condition, and is variously interpreted by different Members of the Society.

The fact that one is “qualified to design” is proved by actual performance, by having added something of some importance to the actual engineering work done in the world. But even this is a matter of degree.

Hence, the interpretation of the requirements of the Constitution as to Members, that is, “responsible charge and ability to design,” must finally be a matter of judgment, founded upon the evidence sub-

mitted ; and the practice has been that in doubtful cases the interpretation should be against the applicant rather than for him. Were the opposite principle adopted, it would be impossible to change the applicant's standing.

The Board is of the opinion that objections to reclassification often come from lack of a proper appreciation of the actual dignity of Associate Membership, and of the delicate distinction between the two grades of Corporate Membership ; and from failure on the part of Members and applicants to consider carefully the constitutional requirements. It should be remembered that promotion to the higher grade is an easy process, if the qualifications exist.

Applications were considered and other routine business transacted.

MEMOIR OF DECEASED MEMBER.

WILLIAM SHELDON HUMPHREY, Assoc. M. Am. Soc. C. E.

DIED APRIL 18TH, 1895.

William Sheldon Humphrey was born at Faribault, Minn., November 25th, 1860. He graduated from the Worcester Polytechnic Institute in 1885, and commenced active work as an engineer in the spring of the following year. His first engagement was with the Chicago, California and Santa Fé Railway on preliminary surveys and location, and he was employed afterward as rodman and instrument man on the construction of various lines of the Atchison, Topeka and Santa Fé Railroad. In the last half of 1887 he was track engineer on the Leavenworth branch of the latter road, and for a few months in 1888 he was transitman on the preliminary surveys and location of the Denison and Washita Valley Railway. At the beginning of 1889, he was engaged as bridge engineer of the Missouri, Kansas and Texas Railway, in which capacity he was employed at the time of his death. During the time of his connection with this road, the company commenced to replace all of the wooden, combination and Howe truss bridges with new iron and steel spans. Mr. Humphrey was in charge of the details of this work, and was engaged at the time of his death in the renewal of the Boonville Bridge across the Missouri River.

He died of consumption in Parsons, Kans., April 18th, 1895, and left a wife and two children. He was elected an Associate Member of the American Society of Civil Engineers on September 2d, 1891.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.	
BALDWIN, HENRY FURLONG.	Chief Engineer Chicago, Peoria and St. Louis Ry., Spring- field, Ill.	Assoc. M. M.	Dec. 7, 1892 Feb. 6, 1895
DORR, EDGAR SUTTON.	43 Cushing St., Cambridge, Mass.		April 3, 1895
MALTBY, FRANK BIERCE.	Resident Engineer Uvdale Irrigation Mfg. and Water Co., Uvdale, Texas.		April 3, 1895
WOOD, HENRY BEECHER.	Room 47, City Hall, Boston, Mass.		April 3, 1895

ASSOCIATE MEMBERS.

BOGGS, JOHN INNEVARTY.	1318 Crawford St., Houston, Texas.		April 3, 1895
COLEMAN, HENRY FITCH.	404 Seventh St., Logansport, Ind.		March 6, 1895
REED, WILLIAM BOARDMAN.	621 Broadway, New York City.		Feb. 6, 1895
VAN CLEVE, AARON HOWELL.	Cataract Con- struction Co., 226 Fifth St., Niagara Falls, N. Y.	J. Assoc. M.	May 31, 1892 Dec. 5, 1894

ASSOCIATES.

ABBOTT, EDWARD LORENZO.	Chicago Edison Co., 139 Adams St., Chicago, Ill.	J. Assoc.	Sept. 6, 1886 April 30, 1895
BOOTH, WILLIAM FERRIS.	Poughkeepsie, N. Y.	J. Assoc.	Jan. 7, 1885 April 30, 1895
LINDSAY, HOMER JONATHAN.	Carnegie Bldg., Pittsburg, Pa.		April 30, 1895

JUNIORS.

BOGEN, LOUIS EDWARD.	Kerper Ave., Cincinnati, Ohio		April 30, 1895
KUMMER, FREDERIC ARNOLD.	32 Park Place, New York City.		April 30, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

BALLARD, ROBERT.....	(Care Bank of New South Wales), Perth, Western Australia.
BOGART, JOHN.....	Consulting Engineer, 50 Wall St., New York City.
BOLLER, ALFRED P.....	Consulting Engineer, 71 Broadway, New York City.
BOTT, JOHN B.....	Principal Assistant Engineer Baltimore Belt R. R., 2216 Oak St., Baltimore, Md.
BROWN, CHARLES O.....	200 Bushwick Ave., Brooklyn, N. Y.
CARR, W. FRANK.....	25 Campbell Ave., Chicago, Ill.
DEVIN, GEORGE.....	184 La Salle St., Chicago, Ill.
DORSEY, EDWARD BATES.....	9 Strand, S. W., London, England.
ELLIOTT, C. G.....	409 Woolner Bldg., Peoria, Ill.
FIELD, GEORGE S.....	452 Delaware Ave., Buffalo, N. Y.
HAWES, JAMES D.....	Vice-President and General Manager Detroit and Mackinaw Ry., Detroit, Mich.
HAZLEHURST, GEORGE B.....	Catonsville, Baltimore Co., Md.
LUDLOW, WILLIAM.....	Major of Engineers, Bvt. Lt.-Col. U. S. A., 303 West 84th St., New York City.
NOURSE, E. G.....	451 The Rookery, Chicago, Ill.
OWENS, H. K.....	North Yakima, Wash.
PAINE, A. B.....	Astoria, Ore.
PARKER, C. O.....	Superintendent Alabama Midland Ry., Montgomery, Ala.
SEARS, ALFRED F.....	15 Cortlandt St., New York City.
SHAW, S. F.....	Locating Engineer Government R. R., Puerto Barrios, Guatemala, C. A.
TAYLOR, N. L.....	706 North Second St., Tacoma, Wash.
TUCKER, HOOD.....	(Care West India Improvement Co.), Port Antonio, Jamaica, W. I.
WARD, JOHN F.....	(Care Am. Soc. C. E.), 127 East 23d St., New York City.
WOODBURY, CHARLES J. H.....	Assistant Engineer American Bell Telephone Co., 125 Milk St., Boston, Mass.
YEATMAN, C. P.....	Grand View, Rhea Co., Tenn.

ASSOCIATE MEMBERS.

BRYAN, KENNERLEY.....	272 West 139th St., New York City.
CUMMINGS, R. A.....	S. E. cor. Fourth and Chestnut Sts., Philadelphia, Pa.
FELTON, B. R.....	10 Tremont St., Boston, Mass.
FRENCH, JAMES B.....	Assistant Engineer C. & O. Ry., Richmond, Va.

GARDNER, M. L. 58 Elizabeth Ave., Newark, N. J.
 McMEekin, C. W. 851 Fourth St., Des Moines, Ia.
 STANFORD, H. R. Albany, N. Y.
 WAITE, GUY B. 912 Garden St., Hoboken, N. J.
 WATSON, WALTER Winchester, Va.

ASSOCIATES.

BOGART, S. S. Schraalenburgh, N. Y.
 FUTAMI, KIOSABURA..... Professor of Civil Engineering, The Third
 Kotogakko, Kyoto, Japan.

JUNIORS.

BAUM, GEORGE..... Assistant Engineer United Electric Light and
 Power Co., 108 Fulton St., New York City.
 BELL, G. J. (Care A. T. & S. F. R. R.), Galesburg, Ill.
 COLEMAN, F. A. Rome, N. Y.
 CRAIG, W. R. Tidewater, McDowell Co., West Va.
 EASTWOOD, JOHN T. First Assistant Engineer, Sewerage Dept.,
 Portsmouth, Va.
 GODDARD, L. H. (Mills & Goddard, Architects), Wesley Block,
 Columbus, Ohio.
 HURTIG, J. B. (Care Wrought Iron Bridge Co.), Canton,
 Ohio.
 KIBBE, AUG. S. Chester, Pa.
 LUDWIG, ALFRED..... 725 Nineteenth St., N. W., Washington, D. C.
 MICHIE, W. R. Johnstown, Pa.
 MILLER, R. P. (Care Long Island R. R.), Amagansett, N. Y.
 NICHOLS, CHARLES H. Box 22, Branford, Conn.
 REINHOLDT, K. O. P. 514 Watchung Ave., Plainfield, N. J.
 SHALEB, IRA A. 40 Wall St., New York City.
 VIER, HENRY..... Assistant Engineer N. Y. C. & H. R. R. R., 145
 Washington St., Buffalo, N. Y.
 WATSON, T. T. Fulton, Lewis Co., Wash.
 ZABRISKIE, A. J. 1201 Broad St., Newark, N. J.

DEATHS.

DOWNES, STANCLIFF BAZEN Elected Junior April 7th, 1886; died April
 21st, 1895.
 HUMPHREY, WILLIAM SHELDON.. Elected Associate Member September 2d, 1891;
 died April 18th, 1895.

ADDITIONS TO LIBRARY AND MUSEUM.

- From American Institute of Architects, N. Y.:
Architectural Souvenir of the Twenty-eighth Annual Convention, October, 1894.
- From George S. Baxter, N. Y.:
A New Method of Calculating the Cubic Contents of Excavations and Embankments. J. C. Trautwine.
Descriptive Geometry as applied to the Drawing of Fortification and Stereotomy. D. H. Mahan.
Civil Engineering. D. H. Mahan.
On the Strength of Beams and Columns. B. Baker.
Long-Span Railway Bridges. B. Baker.
Treatise on Topographical Drawing. S. Eastman.
A System of Useful Formulæ adapted to the Practical Operations of Locating and Constructing Railroads. Simeon Borden.
On the Strength of Cast-Iron Pillars. James B. Francis.
Plans, Profiles and Maps accompanying the Annual Report of the State Engineer and Surveyor (New York) on the Canals for 1899.
The Assistant Engineer's Railway Guide, 1846. 2 vols.
Encyclopedia of Civil Engineering. Edw. Oresy.
Practical Tunneling. F. W. Simms.
Railway Practice. S. C. Brees. 3 vols.
Appendix to Railway Practice. S. C. Brees.
- From Board of Railroad Commissioners of Massachusetts, Boston, Mass.:
Twenty-sixth Annual Report, January, 1895.
- From Board of Trustees of the Sanitary District of Chicago:
Proceedings February 13th, 20th, 27th; March 6th, 13th, 20th, 27th.
- From Reginald Bolton, New York:
Motive Powers and their Practical Selection.
- From George Bowers, Lowell, Mass.:
Twenty-second Annual Report of the Lowell Water Board for 1894.
- From Celso Capacci, Florence, Italy:
L'Esposizione ed i Congressi di Chicago nel 1893.
- From Continental Iron Works, Brooklyn, N. Y.:
Illustrated Catalogue of Morrison Suspension Furnaces.
- From Cornell University, Ithaca, N. Y.:
Library Bulletin, March, 1895.
- From Engineer's Club, N. Y.:
Constitution, Rules, Officers and Members, 1895.
- From Franklin Institute, Philadelphia, Pa.:
The Franklin Institute. A Sketch of its Organization and History.
- From A. Huet, Hague, Holland;
De meest voordeelige Wijze van Landaanwinning in de Zuiderzee.
- From Institution of Civil Engineers, London, Eng.:
Minutes of Proceedings, Vol. CXIX.
List of Members, April 1st, 1895.
- From Potsdam Rad Sandstone Company
Potsdam, N. Y.:
Calendar for 1895.
- From Andrew Rosewater, Omaha, Neb.:
Annual Report of the City Engineer of the City of Omaha, December 31st, 1894.
- From State Agricultural College, Fort Collins, Colo.:
Agricultural Experiment Station, Bulletins Nos. 29, 30.
- From U. S. Department of the Interior, Census Office:
Report on Indians Taxed and Indians not Taxed in the United States. Eleventh Census, 1890.
- From U. S. Department of State:
Consular Reports, March, 1895.
- From U. S. Patent Office:
Alphabetical Lists of Patentees and Inventions for the Quarter ending December 31st, 1894.
- From U. S. Treasury Department:
Annual Report of the Light-House Board for the Fiscal year ending June 30th, 1894.
Report upon the Exhibit of the Light-House Board at the World's Columbian Exposition.
Report upon Fog-Signal Experiments.
- From U. S. Treasury Department, U. S. Coast and Geodetic Survey:
Bulletins Nos. 31, 32, 33.
- From U. S. War Department, Chief of Engineers:
Fifteen Specifications for the Improvement of Certain Rivers and Harbors.
Thirteen Reports on the Improvement of Certain Rivers and Harbors.
- From University of the State of New York, Albany, N. Y.:
State Library Bulletin, Legislation No. 5.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—May, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

MAY 1ST, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 71 Members and 18 visitors.

The reading of the minutes of the meetings of April 3d and April 17th was dispensed with, and they were adopted as printed in BULLETIN No. 59.

The Secretary announced the deaths of the following members: Major-General John Newton, Hon. M. Am. Soc. C. E., elected April 30th, 1884; died May 1st, 1895. William Sheldon Humphrey, Assoc. M. Am. Soc. C. E., elected September 2d, 1891; died April 18th, 1895. Stancliff B. Downes, Jun. M. Am. Soc. C. E., elected April 7th, 1886; died April 21st, 1895.

The Secretary presented a paper on "Painting of Iron Structures Exposed to Weather," by E. Gerber, M. Am. Soc. C. E., and read correspondence on the subject from Messrs. Carl Gayler, Samuel G. Art- ingstall, R. Montfort, W. B. W. Howe, Joseph M. Wilson, A. E. Hunt, G. H. Thomson, L. S. Randolph, A. S. Riffle and A. F. Robinson. Messrs. O. F. Nichols and F. Collingwood presented written discus- sions, and the subject was verbally discussed by Messrs. Charles B. Dudley, George A. Just, A. H. Sabin, J. J. R. Croes, George S. Morison and Charles E. Emery.

Ballots were canvassed, and the following candidates were declared elected to the grades mentioned:

As Members: Daniel Edward Bradley, East Berlin, Conn.; William Barnard Fuller, Waverly, Mass.; John Hislop, Los Angeles, Cal.; Francis Edwin House, Beaver, Pa.; Charles Bradley Rowland, Greenpoint, N. Y.; Albert Alexander Trocon, Leavenworth, Kan.; Nisbet Wingfield, Atlanta, Ga.

As Associate Members: Charles Corner, Austin, Tex.; Clarence L. Crabbs, Chicago, Ill.; John Blackstone Hawley, Forth Worth, Tex.; Victor King Hendricks, Logansport, Ind.; Edwin Seton Jarrett, New York; Richard Khuen, Jr., Pencoyd, Pa.; James Knox Lyons, Pittsburgh, Pa.; George Alfred Ricker, Buffalo, N. Y.; John Godfrey Spillman, Pittsburg, Pa.; Edward Walther, Holyoke, Mass.; John William Woermann, Milan, Ill.

The Secretary also announced the election by the Board of Direction on April 30th, 1895, of the following candidates:

As Associates: Edward Lorenzo Abbott, Chicago, Ill.; William Ferris Booth, Poughkeepsie, N. Y.; Anthon Chileon Douglass, Niagara Falls, N. Y.; Homer Jonathan Lindsay, Pittsburg, Pa.

As Juniors: Louis Edward Bogen, Cincinnati, O.; James Harvey Dingle, Charleston, S. C.; Frederick Luke Douglas, New York City; Frederic Arnold Kummer, New York City; Henry Basil Magor, New York City; Alfred Clarence Olney, Jacksonville, Fla.; Albert Ferdinand Reichmann, Chicago, Ill.; Paul Albert Seurot, Ozone Park, N. Y.; George Whitfield Sykes, Mercer, Pa.; George Aymar Taber, Winchester, Mass.; Warren Bertram Travell, New York City; Henry Eleazer Vanderlip, Indianapolis, Ind.; Clarence Browning Vorce, Stamford, Conn.

Adjourned.

MAY 15TH, 1895.—The Society met at 20 o'clock, Director Foster Crowell in the chair; J. M. Goodell acting as Secretary, and present 66 Members and 12 visitors.

Announcement was made that the Secretary had been called to Boston to attend a meeting of the Committees in charge of the arrangements for the Convention and that a detailed programme would be soon issued.

William R. Hill, M. Am. Soc. C. E., read a paper on "The Water-Works of Syracuse, N. Y." Correspondence on the subject from Messrs. John W. Hill and J. L. Van Ornum was read, and a written discussion was presented by Mr. J. J. R. Croes. The paper was discussed verbally by Messrs. E. Sherman Gould, J. J. R. Croes, T. C. Clarke, Charles E. Emery, John Bogart, L. L. Buck, J. N. Greene, R. S. Buck, J. M. Goodell, Alexander Potter and G. L. Christian.

The Chair announced the death of Eckley B. Coxe, Member of the Society, elected February 7th, 1877; died May 13th, 1895.

Adjourned.

MEMOIR OF DECEASED MEMBER.

STANCLIFF BAZEN DOWNES, Jun. Am. Soc. C. E.

Stancliff Bazen Downes was born at New York City, December 5th, 1859. He graduated from the School of Mines, Columbia College, in 1882, and was soon engaged under the Topographical Engineer of the Department of Public Parks of New York City on the preparation of tax maps of the portion of the city north and east of the Harlem River. In May, 1885, he was promoted to the position of Assistant Engineer, which he held for some time. He took part in the excursion of American Engineers to Europe in 1889. On his return he prepared plans for the drainage of his estate and surrounding property at Milford, Conn., and subsequently executed other engineering works for its improvement. From February, 1895, until his death, he was engaged as assistant to the Secretary of the American Society of Civil Engineers. He was of a retiring disposition and a hard worker, spending much of his leisure time in a workroom which he had fitted up in his home. While he was not a club man in the social sense of the term, he belonged to a number of societies, especially those of a historical nature, to which his descent from early pioneers in this country gave him admittance. His unexpected death from pneumonia and heart failure, succeeding an attack of measles, was a great shock to all engaged in the work of the Society.

Mr. Downes was elected a Junior of the American Society of Civil Engineers on April 7th, 1886.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.	
BRADLEY, DANIEL EDWARD.....	Berlin, Conn.	May	1, 1895
FULLER, WILLIAM BARNARD.....	Engineer Mass. Gen. Hospital Corporation, 53 State St., Boston, Mass.	J. June	3, 1885
		M. May	1, 1895
HOUSE, FRANCIS EDWIN.....	Chief Engineer P. & L. E. R. R., Pittsburg, Pa.	May	1, 1895
PRICE, WILLIAM GUNN.....	Pierre, S. Dak.	April	3, 1895

MAY PROCEEDINGS.

ROWLAND, CHARLES BRADLEY....	Continental Iron Works, { J. May 2, 1888
	Greenpoint, N. Y. { M. May 1, 1895
TROCON, ALBERT ALEXANDER....	Leavenworth, Kans. May 1, 1895
WINGFIELD, NISBET.....	414 Norcross Bldg., Atlanta, Ga. May 1, 1895

ASSOCIATE MEMBERS.

CRABBS, CLARENCE LINCOLN.....	(Care Met. Elevated R. R. Co.), 260 Franklin St., Chicago, Ill. May 1, 1895
HENDRICKS, VICTOR KING.....	Engineer T. H. & I. R. R., Logansport, Ind. May 1, 1895
JARRETT, EDWIN SETON.....	(Care SooySmith & Co.), Mills Bldg., New York City. May 1, 1895
LYONS, JAMES KNOX.....	438 Webster Ave., Pittsburg, Pa. May 1, 1895
WALTHER, EDWARD.....	City Engineer, Holyoke, Mass. May 1, 1895
WOERMANN, JOHN WILLIAM.....	Milan, Ill. May 1, 1895

ASSOCIATE.

DOUGLASS, ANTHONY CHILEON...	Niagara Falls, N. Y. April 30, 1895
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JUNIORS.

OLNEY, ALFRED CLARENCE.....	Assistant Engineer Jacksonville Terminal Co., Jacksonville, Fla. April 30, 1895
SEARLE, CHARLES DEPEW.....	32 West 126th St., New York City. March 5, 1895
SEUROT, PAUL ALBERT.....	Box 53, Ozone Park, N. Y. April 30, 1895
VORCE, CLARENCE BROWNING....	Stamford, Conn. April 30, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

AIKEN, W. A.....	4829 Madison Ave., Chicago, Ill.
BERGEN, VAN BRUNT.....	Chief Engineer Dept. City Works, Brooklyn, N. Y.
BILLIN, CHARLES E.....	48 Cedar St., Chicago, Ill.
BLAND, GEORGE P.....	3218 Woodland Ave., Philadelphia, Pa.
BOLTON, CHANNING M.....	Rio, Albemarle Co., Va.
BRAMWELL, GEORGE W.....	335 Broadway, New York City.
BURR, WILLIAM H.....	151 West 74th St., New York City.
CRAIGHILL, WILLIAM PRICE.....	Brig.-Gen., Chief of Engineers, U. S. A., War Department, Washington, D. C.

CUNNINGHAM, D. W.	627 West 18th St., Los Angeles, Cal.
DEWEY, EDWARD W.	11 Wall St., New York City.
EARLEY, JOHN E.	Calle San Juan de Tetran No. 10, Mexico, Mexico.
FAIRLEIGH, J. A.	Williamsbridge, N. Y.
HOLT, HENRY S.	President The Montreal Gas Co., New York Life Bldg., Montreal, Canada.
KINGMAN, LEWIS.	Mexico, Mexico.
MANSON, MARSDEN.	Chairman Bureau of Highways, Sacramento, Cal.
MAXWELL, JAMES R.	Newark, Del.
McMATH, ROBERT E.	President Board of Public Improvements, City Hall, St. Louis, Mo.
NICHOLS, L. A.	Lake Side, Ottawa Co., Ohio.
READ, ROBERT L.	32 East 3d St., Cincinnati, Ohio.
RICHARDSON, THOMAS F.	Assistant Engineer State Board of Health, State House, Room 140, Boston, Mass.
ROOD, H. M.	26 South 15th Ave., Mt. Vernon, N. Y.
SEARLES, WILLIAM H.	719 Hickox Bldg., Cleveland, Ohio.
SHANKS, THOMAS P.	U. S. Assistant Engineer, Mount Carmel, Ill.
SWIFT, A. J.	New Brunswick, N. J.
THOMPSON, BENJAMIN	Bank of Chattanooga Bldg., Room 4, Chatta- nooga, Tenn.
VAUGHN, GEORGE W.	Vice-President and General Manager S. F. P. & P. Ry., Leavenworth, Kans.

ASSOCIATE MEMBERS.

CARR, ALBERT	74 Ashland Ave., East Orange, N. J.
GARRISON, F. LYNWOOD	Radnor, Delaware Co., Pa.
GRAY, EDWARD, Jr.	City Hall, Richmond, Va.
HARDY, HARRY	Tapachula, Chiapas, Mexico.
MILLER, S. B.	42 West 20th St., New York City.
SHERBERD, M. R.	255 Broadway, Troy, N. Y.
VEDELER, GEORGE H.	10 East 130th St., New York City.

ASSOCIATES.

ABBOTT, E. L.	(Care Chicago Edison Co.), 139 Adams St., Chicago, Ill.
CURRIER, CHARLES GILMAN	51 De Blois Ave., Newport, R. I.
YOUNG, CHARLES G.	706 Equitable Bldg., Baltimore, Md.

JUNIORS.

BELL, GILBERT J.	(Care A. T. & S. F. R. R.), La Junta, Cal.
CLARKE, ST. JOHN.	233 17th Ave., Paterson, N. J.
COWPER, JOHN W.	Supervisor Cairo Div. C. C. C. & St. L. Ry., Mt. Carmel, Ill.

EDES, WILLIAM C.	41 Montgomery St., Room 75, San Francisco, Cal.
ELLIS, D. L.	12½ Fourth St., North Minneapolis, Minn.
HEWITT, CONRAD	329 West 58th St., New York City.
JACKSON, WILLIAM	465 Wilson Ave., Cleveland, Ohio.
MEYER, HENRY C., Jr.	Montclair, N. J.
MONSARRAT, N. D.	(Care Chief Engineer C. L. & W. Co.), Hickox Bldg., Cleveland, Ohio.
PAINE, GEORGE H.	32 Park Place, New York City.
SAX, P. M.	304 Hale Bldg., Philadelphia, Pa.
TUTTLE, S. B.	560 Madison St., Brooklyn, N. Y.

DEATHS.

COXE, ECKLEY B.	Elected Member, February 7th, 1887; died May 13th, 1895.
DAGRON, JAMES GUSTAVUS	Elected Member, October 6th, 1886; died May 25th, 1895.
HASKELL, CHARLES FRED. BEALS	Elected Member, October 7th, 1891; died May 20th, 1895.
NEWTON, JOHN	Elected Honorary Member, April 30th, 1894; died May 1st, 1895.
WELLINGTON, ARTHUR MELLE	Elected Member, May 4th, 1881; died May 16th, 1895.

BOOK NOTICE.

MOTIVE POWERS AND THEIR PRACTICAL SELECTION.

By REGINALD BOLTON, Past President of the Civil and Mechanical Engineers' Society, etc. Cloth, 5½ x 7½ ins., pp. 257. Longmans, Green & Co., N. Y., 1895.

It sometimes happens in the professional life of an engineer that he is called upon to decide upon the various merits of different motive powers, which may be best adapted to the peculiar circumstances of a particular case. While the decision must necessarily rest with the engineer, the information contained in this book is intended to lead him to a correct judgment in forming such a decision.

The author has made a compilation of facts, formulas and data in reference to machinery of different kinds, of practical use to those who are unable to consult many books of reference. The various motive powers discussed are manual power, animal power, the power of wind, of falling water, of steam, of steam engines, of the expansion of gases, of the explosion of vaporized mineral oil in the oil engine, and of electricity.

Water wheels, different types of steam engines, boilers, chimneys and gasoline and hot-air engines are separately discussed, and their cost, availability for use and efficiency given.

Many tables and formulas are embraced in the work, which the author has gracefully dedicated to the Institution of Civil Engineers and the American Society of Civil Engineers.

ADDITIONS TO LIBRARY AND MUSEUM.

- From Campbell W. Adams, Albany, N. Y.:
Annual Reports of the State Engineer
and Surveyor for the years 1889, 1891,
1892 and 1893.
- From American Iron and Steel Association,
Philadelphia, Pa.:
Statistics of the American and Foreign
Iron Trades for 1894.
- From American Society of Mechanical En-
gineers, N. Y.:
Officers, Members and Rules, January 1st,
1895.
- From Ira O. Baker, Champaign, Ill.:
Catalogue of the University of Illinois,
1894-95.
- From Belgian Society of Engineers, Brussels,
Belgium.
Bulletin Annales et Compte Rendu de la
Société Belge des Ingénieurs et des In-
dustriels. Tome III, No. 1.
- From G. H. Benzenberg, Milwaukee, Wis.:
Annual Report of the Board of Public
Works of the City of Milwaukee for
the year ending December 31st, 1894.
- From Board of Trustees of the Sanitary Dis-
trict of Chicago:
Proceedings, April 24th and 26th; May
1st, 8th, 15th.
- From Boston Public Library, Boston, Mass.:
Bulletin, April, 1895.
- From Boston Society of Civil Engineers:
Constitution and By-Laws and List of
Members, May, 1895.
- From California Academy of Sciences, San
Francisco, Cal.:
Proceedings. Vol. IV, Part 2.
- From Octave Chanute, Chicago, Ill.:
Progress in Flying Machines.
- From Department of Mines, Victoria:
Reports on the Victorian Coal Fields.
- From Engineering Society, University of
Iowa:
The Transit, Vol. III, No. 1, January,
1895.
- From Desmond FitzGerald, Boston, Mass.:
Annual Reports of the Boston Water
Board, 10th, 11th, 14th, 19th; 1885,
1886, 1889 to 1894.
- From George S. Greene, Jr., New York:
On Recent Investigations and Applica-
tions of Explosive Agents.
Extracts from English Authorities on
American Locomotives.
Report on Water for Locomotives and
Boiler Incrustation.
Remarks on Making and Applying Con-
crete.
Preliminary Report and Plans, showing
the Necessity of Hydraulic Docks at
Montreal.
Facts as to Hooped Guns.
Report on the Gas Nuisance in New York.
Report on the Quality of the Kerosene
Oil sold in the Metropolitan District.
- Dangerous Kerosene.
Yesso Coals.
The Gold Fields of Yesso.
Hydrographic Reconnaissance of the
Ishikari River Island of Yesso.
Report of the Trial of Locomotive En-
gines.
The Present Situation and Future Pros-
pects of American Railroads.
The Expediency of Building Small-Gauge
Railroads.
Annual Reports of the Eastern Railroad
Company for the year ending June
30th, 1848, 1849.
Argument of Charles G. Loring on behalf
of the Eastern Railroad Company,
March 7th, 1845.
Report of the Albany and Susquehanna
Railroad, 1854.
Opinion of Judge Willard, in the case of
the Albany and Susquehanna Railroad
Company against Abraham A. Stanton
et al., May 23d, 1854.
Report of the Committee for Investigat-
ing the Affairs of the Boston and Provi-
dence Railroad Corporation appointed
by the Stockholders, January 9th, 1856.
- From T. Chalkley Hatton, Wilmington, Del.:
Eighth Annual Statement of the Board of
Directors of the Street and Sewer De-
partment of Wilmington, Del., for the
fiscal year ending January 31st, 1895.
- From B. M. Harrod, New Orleans, La.:
Report on the Drainage of the City of
New Orleans, 1895.
- From B. M. Harrod, H. B. Richardson and
Rudolph Hering, New Orleans, La.:
Report of the Drainage of the City of
New Orleans, 1895.
- From Edwin A. Hill, New Haven, Conn.:
Argon, Prout's Hypothesis and the Peri-
odic Law.
- From John W. Hill, Cincinnati, O.:
The Cincinnati Lancet Clinic, containing
"The Lawrence (Mass.) Filter."
- From G. Th. Hoech, Washington, D. C.:
Trogsschleusen in senkrechten Hehungen
und auf quergeneigten Ebenen.
Das Ferris-Bad in Chicago, 1893.
Amtlicher Bericht über die Weltausstel-
lung in Chicago, 1893.
- From The Ironmonger, London, Eng.:
The Ironmonger Diary.
- From C. Köpcke, Dresden, Germany:
Die neuen Bahnhofsbauten in Dresden.
- From Locomotive and Carriage Superintend-
ents for India, Simla, India:
General Directory and Railway List.
- From Minister of Public Works, Paris,
France:
Commission des Méthodes d'Essai des
Matériaux de Construction. Première
Session, Tome II, Section A (Métaux),
Rapports Particuliers (première série).
- From Robert Moore, St. Louis, Mo.:
Farm Products, Wages, and Silver.

- From Pennsylvania Railroad Company, Philadelphia, Pa.:
Forty-eighth Annual Report, for the year 1894, of the Board of Directors of the Pennsylvania Railroad Company.
- From L. R. Pomeroy, New York:
Steel Axles. Paper read before the New York Railroad Club, December 20th, 1894.
- From Public Works Department, Madras, India:
Administration Report of the Public Works Department, Irrigation Branch, of the Madras Presidency, for the year 1893-94.
- From Railway Equipment Publication Company, New York:
Pocket List of Railroad Officials, 2d Quarter, 1895.
- From Jos. Ramsey, Jr., St. Louis, Mo.:
The St. Louis Union Station. A Monograph by the Architect and Officers of the Terminal Railroad Association of St. Louis.
- From Sanitary Institute, London, Eng.:
Journal of the Sanitary Institute, April, 1895.
- From Morris R. Sherrerd, Troy, N. Y.:
Report of the City Engineer of the City of Troy, for the two years ended February 28th, 1895.
- From Hamilton Smith, London, Eng.:
Superintendent's report, Alaska-Mexican Gold Mining Company, for year ending December 31st, 1894.
- From John C. Smock, Trenton, N. J.:
Report on Water Supply, Water Power, the Flow of Streams and Attendant Phenomena, being Vol. III of the Final Report of the State Geologist of New Jersey.
- From Society of Engineers, London, Eng.:
Transactions for 1894 and General Index, 1857 to 1894.
- From U. S. Department of State:
Consular Reports, October, 1893.
- From U. S. Treasury Department, Bureau of Statistics:
Finance, Commerce, and Immigration of the United States, March, 1895.
- From U. S. War Department, Chief of Engineers:
Annual Report of the Chief of Engineers U. S. A., 1894.
- From U. S. War Department, Chief of Ordnance:
Annual Report of the Chief of Ordnance for the fiscal year ended June 30th, 1894.
- From L. F. Vernon-Harcourt, London, Eng.:
Inland Navigation with Special Reference to the Birmingham District.
- From John Wiley & Sons, New York:
The Mechanical Engineer's Pocket Book.
- From E. D. Worcester, New York:
Twenty-fifth Annual Report of the Lake Shore and Michigan Southern Railway Company, 1894.
- Report of the Board of Directors of the Michigan Central Railroad Company for the year ending December 31st, 1894.

American Society of Civil Engineers.

PROCEEDINGS.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

JUNE 5TH, 1895.—The Society met at 20 o'clock, Director Joseph M. Knap in the chair; Charles Warren Hunt, Secretary; and present, also, 60 Members and 6 visitors.

The reading of the minutes of the meetings of May 1st and May 15th, 1895, was dispensed with and they were adopted as printed in BULLETIN No. 61.

The Secretary announced that a canvass was made on June 4th, 1895, by the Board of Direction of special ballots as provided for in Article III, Section 5, of the Constitution, and that the Board of Direction declared Clarence Blakeslee, of New Haven, Conn., and William Hawley Moore, of New Haven, Conn., elected as Members, and Frank Herbert Snow, of Brockton, Mass., as Associate Member. The Secretary also announced the election on June 4th, 1895, by the Board of Direction of Fred Clinton Phillips, of Little Falls, N. Y., as Junior.

The Secretary announced the deaths of the following Members: James G. Dagon, M. Am. Soc. C. E., elected October 6th, 1886; died May 25th, 1895. Charles F. B. Haskell, M. Am. Soc. C. E., elected October 7th, 1891; died May 20th, 1895. Arthur M. Wellington, M. Am. Soc. C. E., elected May 4th, 1881; died May 16th, 1895.

The Secretary read correspondence by Messrs. R. C. Gemmell, Franklin Riffle, Charles W. Greene, James D. Schuyler, David C. Henny and L. J. Le Conte on Paper No. 743, "The Santa Ana Canal of the Bear Valley Irrigation Company," by William Ham. Hall, M. Am. Soc. C. E., and the paper was discussed by Messrs. J. J. R. Croes and L. L. Buck.

The Secretary also read a discussion by David N. Melvin, M. Am. Soc. C. E., on the paper by E. Gerber, M. Am. Soc. C. E., entitled "Painting of Iron Structures Exposed to Weather," which was presented at the meeting of the Society held May 1st, 1895.

Ballots were canvassed and the following candidates were declared elected to the grades mentioned:

As Members: Branch Harris Colby, St. Louis, Mo.; William Hunter, Philadelphia, Pa.; Colin Macrae Ingersoll, Jr., Jamaica Plain, Mass.; John Walter Ledoux, Philadelphia, Pa.; Ira Alexander Shaler, New York City; Edwin Foster Smith, Philadelphia, Pa.; Vibe Kierulff Spicer, Chicago, Ill.; Henry Dickinson Woods, Newton, Mass.

As Associate Members: Thomas John Brereton, Chambersburg, Pa.; Harry Alexander Gillis, Roanoke, Va.; Howard Arnold Greene, Trenton, N. J.; James Thomas Pardee, Cleveland, O.; Ernest Stenger, Omaha, Neb.; Frank Ellsworth Trask, Ontario, Cal.

Adjourned.

TWENTY-SEVENTH ANNUAL CONVENTION OF THE SOCIETY HELD AT THE HOTEL PEMBERTON, HULL, MASS., JUNE 18TH-22D, 1895.

FIRST SESSION, WEDNESDAY, JUNE 19TH, 1895.—The Society met at 9.15 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary.

In accordance with a resolution of the Board of Direction passed June 18th, 1895, the President appointed the following temporary chairmen to call together the Corporate Members from the several geographical districts, as defined by the Board, to arrange for the presentation at the Business Meeting of not more than two nominees from each district to serve on the Nominating Committee for two years:

First District, T. C. Clarke.

Second District, W. R. Hill.

Third District, S. E. Tinkham.

Fourth District, J. B. Dunklee.

Fifth District, James D. Hawks.

Sixth District, C. F. Loweth.

Seventh District, Milton G. Howe.

The Secretary presented the following report of the Committee appointed to award the Collingwood Prize for Juniors:

"The Committee appointed to award the Collingwood Prize for Juniors for papers written by Juniors of the Society, published in the *Transactions* during 1894, begs to report the award of the prize to Paper No. 699, 'The Renewal of the Channel Pier of the Cincinnati and Muskingum Valley Railway Bridge over the Scioto River,' by Morton L. Byers, Jun. Am. Soc. C. E.

F. COLLINGWOOD,
W. F. WHITTEMORE,
CHARLES WARREN HUNT."

MAY 2D, 1895.

A paper on "The Temperature of Lakes," by Desmond FitzGerald, M. Am. Soc. C. E., was presented in abstract by the author, and discussed by Messrs. F. P. Stearns, Charles G. Darrach, John T. Fanning and Desmond FitzGerald.

A paper on "Experiments on the Discharge of a 30-In. Stop Valve," by J. Waldo Smith, Assoc. M. Am. Soc. C. E., was read in abstract by the Secretary, and discussed by Mr. E. Kuichling.

A paper on "Consumption and Waste of Water," by Dexter Brackett, M. Am. Soc. C. E., was presented in abstract by the author and discussed by Messrs. J. J. R. Croes, John Thomson, C. G. Darrach, E. H. Keating, Desmond FitzGerald, L. F. Rice, H. F. Dunham and Dexter Brackett.

A paper on "A New Weir Formula," by Charles W. Sherman, Jun. Am. Soc. C. E., was read by title.

A paper on "The Separate Sewer System without Automatic Flush-Tanks," by F. S. Odell, M. Am. Soc. C. E., was read by the author, and written discussions received from Messrs. W. B. Landreth, A. Prescott Folwell, Kenneth Allen and Wynkoop Kiersted, were read by Mr. FitzGerald, acting as Secretary. The paper was discussed orally by Messrs. C. G. Darrach, Rudolph Hering and F. S. Odell.

An informal talk on the proposed water supply for the Boston Metropolitan District was given by F. P. Stearns, M. Am. Soc. C. E., and the subject was discussed by Messrs. Desmond FitzGerald, W. E. Worthen, J. N. Greene, W. P. Craighill and George S. Morison.

Announcements concerning excursions and meetings were made by Mr. FitzGerald and the Secretary.

Adjourned.

SECOND SESSION, WEDNESDAY, JUNE 19TH, 1895, 20.30 O'CLOCK.—The Annual Address was delivered by the President, George S. Morison.

THIRD SESSION, THURSDAY, JUNE 20TH, 1895.—The Society met at 9.15 o'clock; President George S. Morison in the chair; Charles Warren Hunt, Secretary.

A paper on "The Philadelphia and Reading Terminal Railroad and Station in Philadelphia," by Joseph M. Wilson, M. Am. Soc. C. E., was presented in abstract by the author and discussed by Messrs. L. L. Buck, C. G. Darrach, E. L. Corthell, C. E. Emery and Joseph M. Wilson.

A paper entitled "What Is the Life of an Iron Railroad Bridge?" by J. E. Greiner, M. Am. Soc. C. E., was presented in abstract by the author. Written discussions by Messrs. G. B. Hazlehurst, C. D. Purdon and M. E. Yeatman were read by the Secretary, and the paper was discussed orally by Messrs. T. C. Clarke, Joseph M. Wilson, George S. Morison and J. E. Greiner.

A paper on "Construction of Substructure for Lonesome Valley Viaduct, Knoxville, Cumberland Gap and Louisville Railroad," by Gustave R. Tuska, Jun. Am. Soc. C. E., was presented in abstract by the author. A written discussion from Mr. William Barclay Parsons was read by the Secretary, and the paper was discussed orally by Messrs. F. V. Abbot, B. R. Green, Foster Crowell, J. N. Greene, C. E. Emery and G. R. Tuska.

A paper on "The Physical Qualities of Acid Open-Hearth Nickel Steel, as Compared with Carbon Steel of Similar Tensile Strength," by H. H. Campbell, M. Am. Soc. C. E., was read in abstract by the Secretary, and discussed by Messrs. Percival Roberts, Jr., and J. V. W. Reynders.

A paper entitled "Notes on the Manufacture and Properties of Malleable Cast-Iron," by H. R. Stanford, Assoc. M. Am. Soc. C. E., was read in abstract by the Secretary.

A paper on "Hollow Tile Floors, Past and Present," by Fr. von Emperger, was read in abstract by the Secretary.

A paper on "Topography on the Survey of the Mexico-United States Boundary," by J. L. Van Ornum, Assoc. M. Am. Soc. C. E., was read in abstract by the Secretary, who also read written discussions on it from Messrs. W. B. Landreth and Kenneth Allen. The paper was discussed orally by Messrs. W. L. Webb and F. V. Abbot.

Announcements as to future meetings and trunk line certificates were made by the President and Secretary.

Adjourned.

BUSINESS MEETING.*

FIRST SESSION, JUNE 20TH, 1895.—The meeting was called to order at 20.30 o'clock; President George S. Morison in the chair; Charles Warren Hunt, Secretary.

Nominations were received for members of the Nominating Com-

* For full report, see page 118.

mittee from each of the seven geographical districts, and the following were elected for two years, as provided in Article VII, Section 2, of the Constitution:

First District, Edward P. North.	Fifth District, J. D. Hawks.
Second District, W. A. Brackenridge.	Sixth District, L. W. Rundlett.
Third District, L. Frederick Rice.	Seventh District, G. A. Quinlan.
Fourth District, Percival Roberts, Jr.	

The Secretary read a resolution unanimously adopted by the Board of Direction June 18th, 1895, regarding a new Society House, and also a report on the answers received to the circular of the Board of Direction, dated May 25th, 1895.* The resolution reads as follows:

"Resolved, That the results of the canvass of the membership in regard to a new Society House be communicated to the Society at its next Business Meeting, with the suggestion that as the responses so far received are indicative of the feasibility of erecting a larger and more commodious building than that proposed in the recent circular, the Committee of the Society, if appointed, should be requested to take the fact into consideration in its action, it being the sense of the Board that a more liberal provision for the future needs of the Society than the circular suggests may be desirable."

Upon a motion of F. V. Abbot, M. Am. Soc. C. E., the following resolution was unanimously adopted:

"Resolved, That it is the opinion of the members of the American Society of Civil Engineers, assembled in Business Meeting, June 20th, 1895, that the present quarters are insufficient, and that new and superior quarters should be procured."

The following motion was made by Clemens Herschel, M. Am. Soc. C. E., and adopted unanimously:

"That the execution of the scheme outlined by the resolution just passed be entrusted to the Board of Direction of this Society."

The President appointed Past Presidents Don J. Whittemore, William E. Worthen, Mendes Cohen and William P. Craighill, a committee to draft resolutions expressing the appreciation of the Society of the various courtesies shown it.

Adjourned to 15.30 o'clock, June 21st.

SECOND SESSION, JUNE 21ST, 1895.—The Society met at 15.30 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary.

Two papers were presented by E. L. Corthell, M. Am. Soc. C. E., the first on "The Literary Product of the International Engineering Congress of 1893," and the second entitled "Résumé of Correspondence from Engineering Societies Relating to Establishing Closer International Relations." These papers were referred to the Board of

* See page 124.

Direction, the first for printing in the proper place in the Society's publications, and the second for action.

Adjourned to 9 o'clock, June 22d.

THIRD SESSION, JUNE 22D, 1895.—The Society met at 9 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary.

The following resolutions were passed :

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to C. P. Clark, Esq., President, and to the New York, New Haven and Hartford Railroad Company, for the special trains kindly furnished for the conveyance of its Members from New York City to the Hotel Pemberton, and from the Hotel Pemberton to Plymouth, as well as for the numerous daily transportation facilities at Nantasket, which have added so largely to the convenience and pleasure of the Convention."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to Lucius Tuttle, Esq., President, T. A. Mackinnon, General Manager, and other officials of the Boston and Maine Railroad Company, for the special train which has been arranged for the pleasure and convenience of the Society, to convey its members from Boston to the Crawford House and return."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to C. E. Barnes, Esq., Superintendent of the Plymouth and Kingston Electric Street Railway, and to J. C. Sanborn, Esq., Superintendent of the Plymouth Division of the New York, New Haven and Hartford Railroad, for the courtesies extended to the Society and to its Members individually on the occasion of the visit to Plymouth on June 20th, 1895."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the Hon. Edwin U. Curtis, Mayor of Boston, Mass., for the facilities afforded for the inspection of the interesting Park System and the magnificent Harbor of the city of Boston, which was so thoroughly enjoyed by all its members."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to Bertrand T. Wheeler, Esq., Superintendent of the Street Department, Boston, Mass., for the use of the steamer *Cormorant* and for other facilities kindly tendered by him, which have added much to the convenience and pleasure of the Annual Convention of 1895."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the West End Street Railway Company, for the various courtesies in the matter of transportation accorded to the Society during this Convention."

" *Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the Board of Metropolitan Sewer Commissioners, for the courtesies extended to the Society on the occasion of its visit to the works under their charge, which proved so interesting and instructive."

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the Boston Society of Civil Engineers and to the local committees in charge of the arrangements for this convention, in recognition of the efficient manner in which the program in all its details has been planned and executed."

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to Major W. R. Livermore, United States Army, and to Commanders F. M. Green and H. G. Colby, United States Navy, for courtesies extended to this Society during the Annual Convention."

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract.)

JUNE 4TH, 1895.—Six members present.

Special reconsideration ballots were canvassed, and Clarence Blakeslee and William Harley Moore were declared elected as Members, and Frank Herbert Snow was declared elected as Associate Member.

Arrangements for the Convention were considered.

Applications were considered and other routine business transacted.

JUNE 18TH, 1895.—The Board met as required by the Constitution (Article VIII, Section 7) at the Hotel Pemberton, Hull, Mass. Twenty members present.

The Secretary presented a report of the answers received to the circular issued by the Board of Direction in the matter of the proposed New House, dated May 25th, 1895 (for this report, see page 124 of the *Proceedings*).

A resolution was unanimously adopted calling the attention of the Society to the fact that the responses to the New Society House circular indicate the feasibility of erecting a more commodious building than proposed in the recent circular, and expressing the sense of the Board that a more liberal provision may be desirable.

In the matter of the appointment of the Nominating Committee under Article VII, Section 2, of the Constitution, the following resolution was passed:

"*Resolved*, That the Board issue notices asking the groups of Members from the several geographical districts, as defined by the Board of Direction, to meet previous to the Business Meeting of the Society on Thursday, and to select not more than two nominees to be presented at such meeting for election as members of the Nominating Committee; each group to be organized from those entitled to vote in that district, and that the President of the Society appoint a temporary chairman for the groups of Members from each of such geographical districts."

REPORT IN FULL OF THE BUSINESS MEETING HELD
DURING THE ANNUAL CONVENTION OF THE SOCIETY
AT THE HOTEL PEMBERTON, HULL, MASS.,
JUNE 19TH-21ST, 1895.

FIRST SESSION, THURSDAY, JUNE 20TH, 1895, 20.30 O'CLOCK.

Meeting called
to order.

President George S. Morison in the chair ; Charles Warren Hunt,
Secretary.

Selection
of Nominating
Committee.

The PRESIDENT.—The meeting will please come to order. This is the Business Meeting of the Society, which it is required shall be held during the Convention under the provisions of the Constitution. It is not customary to read the records at this meeting, but the records of the last meeting of the Society and also of this meeting will be regularly printed in the *Proceedings* in precisely the form in which they will be recorded in the minute books, and so distributed to the Members of the Society. The first business before this meeting is the selection of a Nominating Committee, this Committee being chosen under the provisions of Article VII of the Constitution. In accordance with the provisions of Section 2, Article VII, temporary chairmen were appointed from each of the seven geographical districts, which temporary chairmen were to call the Members from each district together, and are to present not more than two nominees from each district. The Society will then choose by ballot a member of the Nominating Committee to represent each district, not being restricted, however, to these nominations, which are simply suggestions. Unless some objection is raised, the Chair will call up these districts in turn, and as soon as each chairman makes a report, it will be laid before the Society and a ballot called for from that district, this same process being proceeded with for the seven districts successively. The first district embraces the territory within 50 miles of the Post Office of the city of New York, and I will call on the chairman of that district to report the nominations made by the representatives of his district.

Mr. T. C. CLARKE presented the following report:

Report
from First
District

"At a meeting of the Corporate Members of District No. 1, held to-day, the following members were selected as nominees for a member of the Nominating Committee for that district: Edward P. North, George A. Just.

THOMAS C. CLARKE, Chairman."

The PRESIDENT.—The Members residing in District No. 1 have nominated for member of the Nominating Committee Mr. Edward P. North and Mr. George A. Just. The Society will now proceed to ballot for a member of the Nominating Committee from the First District. The Chair would appoint Mr. McCann and Mr. Tratman to act as tellers to

collect ballots. The tellers will provide the Members with paper and will pass around the hats. The Members will please understand that this is a vote of the whole Society, and not a vote simply of the Members residing in the district from which the nominees are to be chosen.

MR. DESMOND FITZGERALD.—Mr. President, do both of these names go on one ballot?

The PRESIDENT.—Only one name is to be voted for. These are simply nominees.

MR. FITZGERALD.—Then, I move that we take up the first name.

The PRESIDENT.—The Chair does not understand the motion.

MR. SMITH.—In order to save going around so many times, I move that all the votes for the different districts be upon one ballot, with the number of each district, and the particular nomination that the Society wishes for each particular district.

The PRESIDENT.—Is that motion seconded? The Chair hears no second.

MR. CLEMENS HERSCHEL.—I would suggest that if four tellers were appointed it would save time.

The PRESIDENT.—The Chair will be very happy to appoint four tellers, and will appoint Mr. Herschel and Mr. Croes as additional tellers.

MR. MENDES COHEN.—Are we to understand the ballot is to be prepared for only the First District, or for each of the districts?

The PRESIDENT.—For only the First District at present.

MR. FITZGERALD.—Is it in order to ask to have the names read again? Some in the back part of the hall did not hear the names.

The PRESIDENT.—The two nominees are Mr. Edward P. North and Mr. George A. Just. Under the provisions of the Constitution, the Society is not limited to these names. They are simply suggestions. That does not prevent their being very good suggestions. Has every gentleman voted? If not, an opportunity is now given. The polls are closed for the First District. I will call on the Chairman of the Second District, the district embracing the remainder of the state of New York, the whole state of New Jersey and Canada, for his report.

MR. W. R. HILL.—Mr. President, District No. 2 presents the names of Mr. W. A. Brackenridge, of Niagara Falls, N. Y., and Mr. Max E. Schmidt, of Princeton, N. J.

Report
from Second
District.

The PRESIDENT.—Gentlemen, you have heard the nominations made by the representatives of the Second District, Mr. W. A. Brackenridge, of Niagara Falls, and Mr. Max E. Schmidt, of Princeton, N. J. You will please prepare your ballots for the Second District.

MR. CHARLES E. EMERY.—Mr. President, if it is in order, I will move you, sir, that the Secretary cast the ballot of this meeting for Mr. W. A. Brackenridge as the nominee for that district.

The motion was seconded.

Report
from Second
District.

The PRESIDENT.—You have heard the motion, that the Secretary cast the ballot of the entire Society for Mr. W. A. Brackenridge, of Niagara Falls, as the member of the Nominating Committee for the Second District. Are there any remarks to be made? If not, the question will be put.

The motion was adopted.

The PRESIDENT.—It is carried. Mr. W. A. Brackenridge is chosen the member of the Nominating Committee from the Second District. I would now call on the Chairman of the Third District, embracing the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, and all foreign countries.

Report
from Third
District.

The SECRETARY.—Mr. President, Mr. S. E. Tinkham, Chairman of District No. 3, who is unable to be present this evening, requested me to present this report for him.

"To the President of the American Society of Civil Engineers:

"At a meeting of the Members of the Society residing in the Third District, as divided by the Board of Direction, held this evening, the following Members were selected for a member of the Nominating Committee: L. Frederick Rice and George F. Swain. Number of members in attendance at the meeting, 30.

"Respectfully submitted,

"S. E. TINKHAM,

"Chairman."

The PRESIDENT.—Gentlemen, Mr. L. Frederick Rice and Mr. George F. Swain are nominated for members of the Nominating Committee from the Third District. You will please prepare your ballots.

Mr. EMERY.—I make the same motion in relation to Mr. Rice.

A MEMBER.—I second the motion.

The PRESIDENT.—The Chair would ask that the motion be put in more regular form.

Mr. EMERY.—I move you, sir, that Mr. L. Frederick Rice be declared the nominee of this meeting for the Third District.

The PRESIDENT.—It is necessary to elect a Member of the Nominating Committee, not simply to declare a nominee. If your motion is that Mr. L. Frederick Rice be elected a Member of the Nominating Committee from this district and that the Secretary be authorized to cast the vote of the Society for him, the motion is in order and will be put, provided it is seconded.

A MEMBER.—I second it.

Mr. EMERY.—I so make the motion.

The PRESIDENT.—Gentlemen, you have heard the motion, that Mr. L. Frederick Rice be elected a Member of the Nominating Committee from the Third District, and that the Secretary be authorized to cast a single ballot for the whole Society for Mr. Rice.

The motion was adopted.

Mr. J. J. R. CROES.—The tellers for the First District report that there were 75 votes cast, of which Mr. Edward P. North received 69, and Mr. George A. Just, 6.

Vote for Nominating Committee from First District.

The PRESIDENT.—The Chair would, therefore, announce that Mr. Edward P. North is elected a member of the Nominating Committee from the First District. It being assumed that the Secretary has cast the single ballot, Mr. L. Frederick Rice is elected a member of the Nominating Committee from the Third District. I will now call on the Chairman of the Fourth District, embracing the states of Pennsylvania, Delaware, Maryland and the District of Columbia.

Mr. JOHN B. DUNCKLEE.—Mr. President, at a meeting of the Corporate Members of District No. 4, held June 19th, the following nominees were selected for a member of the Nominating Committee from this district: Mr. P. Roberts, Jr., Pencoyd, Pa.; Mr. C. M. Bolton, Washington, D. C.

Report from Fourth District.

The PRESIDENT.—Gentlemen, Mr. Percival Roberts, Jr., of Pencoyd, Pa., and Mr. C. M. Bolton, of Washington, D. C., are nominated for members of the Nominating Committee from the Fourth District.

Mr. CROES.—I move the vote of the Society be cast for Mr. Percival Roberts, Jr.

The motion was seconded.

The PRESIDENT.—It is moved that the vote of the Society be cast by a single ballot by the Secretary for Mr. Percival Roberts, Jr., as a member of the Nominating Committee from the Fourth District.

The motion was adopted.

The PRESIDENT.—Mr. Percival Roberts, Jr., is elected a member of the Nominating Committee from the Fourth District. I call now on the Chairman of the Fifth District, embracing the states of Michigan, Ohio, Indiana, Illinois and Wisconsin.

Mr. HORACE E. HORTON.—At a meeting held this day of the Corporate Members in attendance on the Convention to make nominations of two for the position of member of the Nominating Committee, the names of Mr. J. D. Hawks and Mr. Benjamin Reece are presented.

Report from Fifth District.

Mr. SMITH.—Mr. President, I move that the Secretary be authorized to cast a ballot for Mr. Hawks.

The motion was seconded and adopted.

The PRESIDENT.—It is assumed that the Secretary has cast the ballot, and Mr. Hawks is elected a member of the Nominating Committee from the Fifth District. I call on the Chairman of the Sixth District, embracing the states of Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Washington, Montana, Wyoming, Idaho, Colorado, Utah, Oregon and Nevada, for a report. Is Mr. Loweth present? Is there no representative present from the Sixth District?

Nomination
from Sixth
District.

Mr. JOHN T. FANNING.—Mr. Chairman, I have not heard of any meeting of Members from that district. I move that Mr. L. W. Rundlett be a member of the Nominating Committee from that district.

The motion was seconded.

Mr. CROES.—I rise to a point of order. The Constitution or the By-Laws direct that this vote shall be taken by ballot. The President has not named anything about the ballots in his remarks.

The PRESIDENT.—The President has not put the motion. This motion is made. The President declines to entertain it as a motion. If the gentleman will see fit to nominate Mr. Rundlett, his name will be before the Society as a nominee.

Mr. CROES.—Mr. President, I nominate Mr. L. W. Rundlett as the member of the Nominating Committee from the Sixth District.

The PRESIDENT.—Mr. L. W. Rundlett is nominated as the Member of the Nominating Committee from the Sixth District. Other nominations are in order.

Mr. FOSTER CROWELL.—Mr. President, I move that the Secretary cast a ballot for Mr. Rundlett.

The PRESIDENT.—Your motion is out of order. A due time must be given for other nominations. If no others come, your motion will be entertained.

Mr. HERSCHEL.—I move we proceed to ballot, Mr. President.

The motion was seconded.

The PRESIDENT.—It is moved and seconded that we proceed to ballot for a member of the Nominating Committee from the Sixth District. There is but one nomination before the house, Mr. Rundlett.

Mr. FITZGERALD.—Mr. President, I move that the Secretary be authorized to cast a ballot for Mr. Rundlett.

The motion was seconded.

Mr. HARROD.—I rise to a point of order. Mr. Herschel's motion is in order.

The PRESIDENT.—I think Mr. Herschel's motion was not seconded.

Mr. HARROD.—I seconded it.

The PRESIDENT.—It is not before the house. Are you ready for the question? The question is on Mr. FitzGerald's motion, that the Secretary cast a single ballot for the whole Society for Mr. Rundlett as a member of the Nominating Committee from the Sixth District.

The motion was adopted.

The PRESIDENT.—It being assumed that the Secretary has cast the ballot, Mr. Rundlett is elected a member of the Nominating Committee from the Sixth District. I call on the Chairman from the Seventh District, embracing the states of Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Florida, Texas, Tennessee, Kentucky, Indian Territory, Oklahoma, New Mexico, Arizona, Arkansas and California.

Mr. MILTON G. HOWE.—Mr. President, at a meeting held this evening by the Members from the Seventh District, the following parties were named or suggested for the Nominating Committee of the Seventh District: Mr. B. M. Harrod, of New Orleans, and Mr. G. A. Quinlan, of Houston, Tex. Report
from Seventh
District.

The PRESIDENT.—Mr. B. M. Harrod is not eligible, being a member of the Board of Direction.

Mr. HARROD.—I doubt my eligibility.

The PRESIDENT.—The Chair has already decided that you are not eligible.

Mr. HOWE.—We did not know that. We will suggest some other name.

The SECRETARY.—One will do, sir.

Mr. HOWE.—Well, Mr. G. A. Quinlan, of Houston, Tex.

The PRESIDENT.—Gentlemen, the two nominees made by the committee are Mr. B. M. Harrod, of New Orleans, La., and Mr. G. A. Quinlan, of Houston, Tex. Mr. B. M. Harrod, of New Orleans, being a member of the Board of Direction, is ineligible. There is, therefore, but one nomination made by the Committee, Mr. G. A. Quinlan.

Captain F. V. ABBOT.—As a Member of the Seventh Section, I would move that we be authorized by the Convention to nominate Mr. Richardson in place of Mr. B. M. Harrod; that our Chairman be authorized to change his nomination in that way.

The PRESIDENT.—If the Chairman is willing to accept that modification, the name will be considered as nominated.

A MEMBER.—I move, as a substitute, that the Secretary be authorized to cast the ballot of the Society for Mr. G. A. Quinlan.

The motion was seconded.

The PRESIDENT.—It is moved and seconded that the Secretary be authorized to cast a single ballot for Mr. Quinlan as member of the Nominating Committee from the Seventh District. Are there any remarks? Are you ready for the question?

The motion was adopted.

The PRESIDENT.—It is assumed that the Secretary has cast the ballot of the whole Society for Mr. Quinlan, and Mr. Quinlan is elected a member of the Nominating Committee. The Nominating Committee elected to serve for the ensuing two years consists, therefore, of the following gentlemen: Mr. Edward P. North, Mr. W. A. Brackenridge, Mr. Percival Roberts, Jr., Mr. J. D. Hawks, Mr. L. W. Rundlett, Mr. G. A. Quinlan. The Nominat-
ing Committee
as elected.

Mr. FITZGERALD.—Mr. L. Frederick Rice's name was not called.

The PRESIDENT.—And Mr. L. Frederick Rice. Gentlemen, this completes the work in regard to the election of the Nominating Committee, and any other business is now before the house. The Secretary will read a resolution passed last night by the Board of Direction, in regard to the New Society House, and will make a report on the results of the circular.

Resolution of
Board of
Direction on
New Society
House.

The SECRETARY.—At a meeting of the Board of Direction held last evening, the following resolution was adopted:

“Resolved, That the results of the canvass of the membership in regard to a new Society House be communicated to the Society at its next Business Meeting, with the suggestion that as the responses so far received are indicative of the feasibility of erecting a larger and more commodious building than that proposed in the recent circular, the Committee of the Society, if appointed, should be requested to take the fact into consideration in its action, it being the sense of the Board that a more liberal provision for the future needs of the Society than the circular suggested may be desirable.”

REPORT ON NEW SOCIETY HOUSE CIRCULAR.

Report on New
Society House
circular.

“I have the honor to present the following summary of answers received to the circular issued by the Board of Direction in the matter of the proposed new house, dated May 25th, 1895.

Total number of answers received, 266.

Of these 258, or 97%, are in favor of the project as outlined in the circular. Eight, or 3%, express themselves as not in favor of the project for various reasons.

Of the 258 in favor of the project:

200, or 77.51%, make subscription, either in cash or to the bonds.

49, or 19%, do not subscribe, but state that they will do what they can when the time comes.

3, or 1.16%, are in favor, but say nothing further.

3, or 1.16%, are in favor, but do not feel able to subscribe.

1, or 0.39%, is so recent a Member, that he does not feel free to express himself about the matter.

1, or 0.39%, is in favor of a joint building for all societies.

1, or 0.39%, is in favor of bonds extending over 10 or 20 years, the obligation to be met by proper increase of dues from all grades of membership.

The following reasons are given by the eight who are not in favor of the scheme.

1 says: ‘Let us go on creating a fund instead of a debt, and some day we will find a way to spend it.’

1 ‘not in favor of a permanent location, because it cannot now be told with certainty to what point within the city travel from outside will converge.’

1 ‘cannot see any reason for going into debt.’

5 ‘do not favor the project on account of hard times.’

Other comments by those who do not subscribe are as follows:

1 ‘the scheme is not sufficiently broad and will be outgrown in 10 years.’

2 are in favor of an increase in annual dues.

1 would favor plan if library were circulating, otherwise not.

1 is not in favor of bonds.

2 are in favor of bonds in some form.

1 would take three or four \$1 000 mortgage bonds.

1 does not think the money can be raised by subscription; hence favors bonds.

1 says: 'I should not agree to the issuance of bonds of the Society unless advised that such a course was within the prerogatives conferred by the charter.' States that this Society might reasonably avail itself of the provisions of the statute law, which would relieve it from taxation by the formation of a library association, 'with the capital stock so issued, that the Society, as a corporation, should own the majority of it, issuing bonds on that property, and the American Society of Civil Engineers to own bonds representing its contribution for the purposes. The building to be leased to the American Society of Civil Engineers.'

Of the 200 who have responded by saying that they will either subscribe in cash or take bonds of the various denominations proposed:

120 make cash subscriptions.

44 agree to take bonds.

36 make cash subscriptions and also agree to take bonds.

53, or 26%, are Resident.

147, or 74%, are Non-Resident.

144 are Members.

22 Associate Members.

12 Associates.

20 Juniors.

1 Fellow.

1 Subscriber to the Building Fund.

The total result of the subscription is as follows:

156 cash subscriptions (averaging \$51.80)..	\$8 080 00
49 \$100 non-interest bearing bonds.	4 900 00

Total cash and non-interest paying bonds	\$12 980 00
52 \$375 4% bonds, making...	\$19 500 00
30 \$625 4% bonds, making...	18 750 00
Total 4% bonds subscribed for.....	38 250 00

Total amount of subscription from 200 persons (an average of \$256.15) in cash and bonds..	\$51 230 00
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Total Sub-
scriptions for
New Society
House.

Several of those who subscribe say, that, if necessary, they will do more than they now promise.

The following are some of the comments by gentlemen who have made subscriptions:

18 are in favor of subscription only.

3 are in favor of no subscription, the amount to be raised by the issue of bonds only.

22 are in favor of bonds to be only issued to cover a deficiency in the subscription.

Report on New
Society House
Circular.

- 2 state that the bond issue should not exceed \$25 000 or \$30 000.
- 1 favors an addition to the annual dues until the total amount is paid.
- 1 states that the new Society House should be located between Forty-second and Fifty-ninth Streets, Fourth and Sixth Avenues.
- 1 suggests an increase of dues to pay interest on bonds and create a sinking fund to pay them off.
- 1 does not believe in subscription scheme, and says: 'Denomination of bonds should be \$500 or \$1 000; that 3% interest should be sufficient; that, following the spirit of the Constitution, there should be a sufficient number of Resident Members on the proposed committee to insure its continuous working, say three Members from District No. 1, and one from each of the other six districts.'
- 1 suggests that the project will appeal to Non-Resident Members if a 'sleeping room' feature were added.
- 2 believe that \$50 000 is not sufficient for a suitable permanent house.
- 4 are in favor of joint action by all the engineering societies.
- 3 think that a \$35 assessment should be made.
- 1 thinks the cost of the lot too small.
- 1 suggests bonds of \$25 and \$50 denominations.
- 1 thinks the rate of interest on bonds should be 4½ per cent.
- 1 proposes to levy a special assessment on all new Members after January 1st, 1896, forming a sinking fund, etc.
- 1 thinks a difference should be made between the contribution of Resident and Non-Resident Members.

Respectfully submitted,

CHAS. WARREN HUNT,
Secretary."

JUNE 13TH, 1895.

Additional
Subscriptions
for New
Society House.

Since the above report was written, 12 additional replies have been received, as follows: In favor of the scheme, 11; not in favor of the scheme, 1, and that on account of the hard times. The result of the additional subscription is a cash subscription of \$165 and an addition to the bond subscription of \$1 375, which, added to the amount given before, make a grand total of \$52 770.

The PRESIDENT.—Gentlemen, you have heard the resolution of the Board of Direction and the results of the issue of the circular. The matter is now before the Society at large. What action do you wish to take?

A MEMBER.—I move that the report be accepted.

The PRESIDENT.—This is not the report of a committee. It is simply an announcement made by the Board of Direction of the Society for action by the Society.

Mr. JOHN BOGART.—Mr. President, I don't understand that there is any committee that exists at present.

The PRESIDENT.—There is no committee. The whole matter is put before the Society for the information of the Society. It is simply a matter for the Society to take action on.

Mr. CROWELL.—I move that the circular be read.

The PRESIDENT.—It is not necessary to put the motion. The Secretary will read the circular.

The SECRETARY read the circular as follows :

“ To the Members of the American Society of Civil Engineers : ”

The Board of Direction having become impressed with the need of better accommodations for the Society and its Library, has thought best to issue this circular to members in all grades.

Circular concerning New Society House.

INADEQUACY OF THE PRESENT HOUSE.

The present Society House, an old New York dwelling with an extension built in 1889, is neither suited to the uses of the Society nor safe for the preservation of the library and records. On account of its location, in what is now a retail business street, the rate of insurance this year has been raised to three times that previously paid. The files, maps and models are necessarily stored in various parts of the house where they cannot be made conveniently accessible to Members.

The meeting room, which is also used as a reading room and library, thus exposing the books to injury from heat, smoke and bad ventilation, will not seat comfortably more than 90 people, and has of late been inconveniently crowded. Annual Meetings have necessarily been held in a hall hired for the purpose.

IMPORTANCE OF EARLY ACTION.

There is a general movement of professional and other societies into new quarters, but lots which will very soon be held at high figures can still be secured at reasonable prices. The present Society House, now worth about twice its cost to the Society, is rapidly increasing in value, but this value is based on its use for retail business purposes and will probably reach its highest point within a year or two, at which time the Society should be able to give immediate possession to the purchaser.

FINANCIAL STATEMENT.

The estimated cost of a new building specially adapted to the wants of the Society on a lot twice the size of the present lot is as follows:

Lot 50 ft. front, 100 ft. deep.....	\$75 000
New House, to contain Library, Large Meeting Room, Directors' Room, Offices, etc	50 000
Total.....	\$125 000

The present available assets are as follows:

The House, 127 East Twenty-third St. (Estimate)	\$60 000
Securities in Safe Deposit (Par Value)	16 000
Cash awaiting permanent investment.....	4 500

Total	\$80 500
Mortgage on 127 East Twenty-third Street.....	16 000

Amount available..... 64 500

Balance required..... \$60 500

Circular concerning New Society House.

The average income from all sources for the past five years has been \$33 000.

The increased annual expenses of the larger House with all contemplated improvements will not exceed \$1 000, and it is believed that more than this sum may be realized by renting the new Meeting Room for purposes allied to the objects of the Society.

SUGGESTIONS.

The Board makes the following suggestions:

First.—That the total membership of the Society in all grades being now about 1 800, of whom 1 400 are corporate members, an average subscription of \$35 would aggregate \$63 000, a sufficient amount, with our present assets, to secure a proper site and erect a suitable building free from all incumbrances.

Second.—That if a sufficient amount be not raised by subscription, bonds could be issued of three classes, as follows:

A.—Bonds of small denominations—say \$100 each—bearing no interest, but redeemable by lot at specified dates, these being practically a loan to the Society without interest, but with good security.

B.—Bonds in denominations of \$375, bearing interest at 4%, which would exactly pay the dues of non-resident members.

C.—Bonds in denominations of \$625, bearing interest at 4%, which would exactly pay the dues of resident members.

A large issue of bonds is not desirable, as the interest on the bonds must be met from the current revenues.

Third.—In view of the great importance of the movement, the Board suggests that a Committee of seven, representing the Society at large, one from each of the seven geographical districts, be elected at the Annual Convention; that such Committee be empowered to mature a plan of procedure, procure subscriptions and adopt a site, this action to receive the approval of a majority of the whole Board of Direction, which may be given if necessary by letter; the Committee to be known as the Committee on New House.

Fourth.—That when funds have been secured and the site of the building adopted, the Committee shall be discharged and the Trustees of the Society be authorized to procure plans, and, in the exercise of their functions as the legal representatives of the Society, to proceed with the work of construction, to perform any and all acts necessary to complete the building, and to dispose of the present Society House.

To test the general feeling of the Society, members are requested to fill out the attached blank and return it in the enclosed envelope, so that a statement may be prepared for presentation at the Annual Convention.

By order of the Board of Direction,

CHAS. WARREN HUNT,

Secretary."

MAY 25TH, 1895.

Mr. JOSEPH P. DAVIS.—Do I understand that the Special Committee is authorized to purchase the lot?

The PRESIDENT.—No special committee has yet been appointed.

Mr. DAVIS.—I understand that, sir; but I want to know what power it has.

The PRESIDENT.—It has no power, except as may be determined by a vote of the Society at this meeting.

The SECRETARY.—The words are, “and adopt a site.”

Mr. DAVIS.—I understand that, but I would like to know what that provides it should do. I did not quite catch it; that is all.

The SECRETARY read the clause referred to, and also the following one.

Capt. ABBOT.—Mr. President, before we get into a general discussion of methods, I move:

Motion made
in favor of New
Society House.

That it is the general opinion of the Convention here present that it is advisable for the American Society of Civil Engineers to dispose of its present house and to procure better quarters by methods to be hereafter determined by this Convention or by vote of the Society.

The PRESIDENT.—Gentlemen, you have heard the motion. Is it seconded?

Mr. OBERLIN SMITH.—I second it.

The PRESIDENT.—It is moved and seconded that it is the sense of this Convention that the Society should dispose of its present Society House and procure—

Mr. CROES.—Allow me to make one suggestion, pending that. This is not a suggestion of “this Convention.” This is a Business Meeting of the Society held during the Convention, and any resolution passed at it would not be a suggestion of the Convention.

The PRESIDENT.—As the resolution is a very important one, and has a very important bearing, the Chair would request the maker to put it in writing.

Mr. HERSCHEL.—Mr. President, I will make a motion and perhaps the gentleman will accept it as a substitute, and it is this:

That this whole matter be left to the Government of the Society to be dealt with.

It seems to me it is in a condition in which it is eminently fit that the Government should take hold of it. The suggestion for a Special Committee came very well in the circular, but it seems to me that the object that was intended to be accomplished by that Special Committee has practically been accomplished by the circular and by the votes upon it; and it is for that reason that I make the motion that this matter be left to the Government of the Society to proceed with.

Mr. T. C. CLARKE.—I second the motion, and I think that the reasons that—

The PRESIDENT.—A second of this motion is not in order. If the motion is accepted by Captain Abbot as a substitute for his motion,

Discussion on
New Society
House.

it will be before the house, but unless accepted by Captain Abbot, it is not before the house.

Capt. ABBOT.—I prefer to put the motion in the shape that I have it, sir. In the mean time, if the rest of the business can proceed and this come up later, I will get it in proper shape.

The PRESIDENT.—You withdraw your motion.

Capt. ABBOT.—Temporarily.

The PRESIDENT.—Capt. Abbot's motion is withdrawn.

Mr. CROWELL.—Mr. President, I should like to ask Capt. Abbot to renew the motion, which, I think, does not conflict at all with the motion which, perhaps, Mr. Herschel will then offer afterward. Mr. Abbot's motion is an adoption by the Society at this Business Meeting of the idea that the change is a desirable one. The method by which it can be accomplished is covered by the motion, if Mr. Herschel then makes it. And I would ask Capt. Abbot if he would not renew it.

Capt. ABBOT.—My motion was that the method by which the change should be made should be subsequently determined by the Society. It was simply to express the opinion of the Society, as represented by those who are here present, to the effect that such a change is necessary and should be made. It provides nothing about the method of doing it, or that it shall be done, or who shall do it, but simply expresses the opinion of the Society that this change of quarters should be made, and that new and suitable quarters should be obtained.

The PRESIDENT.—If Capt. Abbot will be kind enough to put that in writing as soon as possible, it will be put before the meeting.

Mr. BOGART.—If Capt. Abbot will put his motion in writing, I think it will solve this question much quicker. I don't think it conflicts at all.

Mr. HARROD.—I agree entirely with Mr. Crowell. If the Society should see fit to adopt Mr. Herschel's suggestion and leave this matter in the hands of the Government of the Society, I am absolutely sure that the Government of the Society would very much prefer having the expression of opinion of this meeting that Mr. Abbot's motion would give.

Mr. HERSCHEL.—Well, I will only explain that it seems to me if this Society leaves this matter in the hands of the Government to proceed with it, that it means that they are in favor of it. It tends to embody both ideas.

The PRESIDENT.—It certainly will show it if we pass both motions, and Capt. Abbot's motion, having been made first and seconded, will have to be put first. Capt. Abbot's motion, as reduced to writing, reads as follows:

Resolution in
favor of New
Society House.

"*Resolved*, That it is the opinion of the members of the American Society of Civil Engineers, assembled in Business Meeting, June 20th, 1895, that the present quarters are insufficient, and that new and superior quarters should be procured."

This is the form of motion as reduced to writing. The form, I understand it, is satisfactory to the Secretary. Are you ready for the question, or do you wish to make remarks?

One member seconded the motion, other members called for "question."

The motion was adopted unanimously.

Mr. HERSCHEL.—Now, Mr. President, I renew my motion.

The PRESIDENT.—Will you please repeat it?

Mr. HERSCHEL.—It is:

That the business of proceeding under the motion just made be left to the Government of this Society.

The PRESIDENT.—Is the motion seconded?

The motion was seconded.

The PRESIDENT.—It is moved and seconded that the business of carrying out the scheme outlined in the motion just passed be entrusted to the Government of the Society. Is that correctly stated?

Mr. HERSCHEL.—Yes, sir.

The PRESIDENT.—Are there any remarks? It is a very important question, and any remarks are in order.

Mr. SPENCER MILLER.—Mr. President, as I understand it, when that motion is carried, that practically disposes of the entire question, so far as the membership of the Society is concerned, and places it in the hands of the Board of Direction.

Discussion on
New Society
House.

The PRESIDENT.—That is correct.

Mr. MILLER.—Now, as far as I am concerned, I think that is the wisest thing to do, but on this motion I should like to inquire why this body does not seem to favor joint action with other societies. It seems to me there is some very good reason for it, which has not been apparent to me. A number of people I have talked to seem to think that joint action might be ideal, and it is quite likely that some one can enlighten us on that question.

Mr. PERCIVAL ROBERTS, Jr.—Mr. President, if the gentleman who has just sat down has experienced any of the pleasures of having two in a room, as some of us are now doing here, he may realize why we should prefer to go into separate quarters.

Mr. BOGART.—Mr. President, in addition to the forcible reason given by Mr. Roberts, it is proper for some of the older members to say that the experiment of attempting to accomplish this object by working with other societies has been very carefully tried a number of times in the past, and that the questions which arose as to arrangements and as to ownership of property, and as to the rights which would have to be considered on the legal side of the case were such as to make it absolutely impossible for the Board of Direction to find a way in which it could properly be done. It might not be impossible, if this Society owned its own building and it was large enough, to rent a portion to

Discussion on
New Society
House.

other societies ; but a joint ownership, under legal advice, was found not to be a desirable thing for this Society. The thing has been in years past very carefully canvassed in the city. It was thought of very carefully when we bought our present house. And we can say now, in the light of the circular which has just been read, that there can be no question that we did perfectly right in going it alone then. Our present house cost us \$30 000 ; it is worth \$60 000 to-day, and all that increase of \$30 000 belongs to this Society. If we had another Society in partnership with us, why, it would not all belong to this Society. Those are the reasons which, concisely, seem to us to be against a joint co-operation in ownership. As to occupancy in the future, that can be very well taken care of by the Board of Direction, if we succeed in securing the new house.

MR. OBERLIN SMITH.—Mr. President, there seems to have been five people who answered letters who favored some project for a joint house. There seems to be one man in the crowd here, which I take as a minority, who has just asked about it also. Now, I rise up as a second man, slightly increasing this minority, to say that I have always felt rather in favor of some joint scheme for a house in New York. There may be grave difficulties, such as suggested by Mr. Bogart. Perhaps they are insurmountable. I will say at the beginning that I am thoroughly in favor of the general project of having a new house and selling the old one, and if it must be by this Society entirely alone, so be it ; but before committing ourselves on so very important a project, I think we ought to consider a little further the other scheme that has been suggested. Now, it has been said here to-night that perhaps the Society would not own its own house in fee, or, at any rate, the library part of it, because if the library should be a separate association it might escape taxation and lease the premises to the Society. That is the way that the thing works with the American Society of Mechanical Engineers. Although it has really its own house and its own library, yet legally it has not. It is leased of the library association, thus escaping taxation, which is perfectly just and fair for any concern of great benefit to the public, as is a library of that kind. Therefore, if something of that sort is done in regard to our library by the Society, it is possible that a joint arrangement of that kind might be made without the legal difficulties spoken of by Mr. Bogart. In regard to joint action, it must be evident to everybody that there will be some advantages. There may be compensating disadvantages which would kill it ; but I mention some advantages as they occur to me. Engineers going to New York from outside want to go to a headquarters. They want to go to a place where they will meet their fellows from all over the country, from Europe, talk with them ; they want a sort of an exchange. They want to go where they can do business with them, where they can compare notes. They want to have as good

a time as they often do at conventions of various kinds, and especially at general conventions of the different societies. They want also access to a great library, an engineering library, something better than anything now in this country. They want access to a collection of models and maps and drawings and all these things. Now, we have four great national engineering societies, and a fifth one recently started, which is not so great, the Marine Engineers, and we have a National Institute of Architects. If it could be done—I don't say it can—I say if a great house could be built, perhaps partly endowed, perhaps a scheme as large as that, backed by all these societies, would induce some rich man to give a lot of money for it. If we should have a great and beautiful house, an ornament to the professions of engineering and architecture, an ornament which the whole country would be proud of when showing it to citizens of this country and to foreigners who come here, which was known as the great engineering headquarters of this country, we would all soon get to be proud of it, even if it was not owned wholly by the Society. Now, I don't believe that there is any possibility of the societies joining each other, or coming together and mingling as one society, or anything of the kind; but occupying joint premises will not throw them together at all in any way, it will not make them have anything to do with each other, except that natural contiguity that leads to pleasant acquaintanceship, that leads to more convenience, leads to more business, more study. Now, it must seem evident that such a great and beautiful building, located in a suitable situation somewhere in the upper part of New York, probably between Fourth and Sixth Avenues and near Forty-second Street, and as near as possible to the great new library, would be an object for us. These three libraries, with their private jealousies and prides come together as one, because it is the natural thing, to do more good. The libraries of these societies, which are accumulating and will accumulate models, maps, etc., would do far more good to all of us if concentrated where we could get at them, where we would not have to travel four or five blocks, in snow or in heat, to find one thing in this Society's library, and other things in another society's, several blocks on. Now, if such a building could be had in New York, put up, worth \$1 000 000, or whatever it would cost, and if all the societies were to have entirely separate quarters, leased of the trustees, who would own this building legally, and probably without taxation; if these different societies could have entirely separate suites of apartments, so they would be entirely separate from each other and this great library, access to it being free to all, perhaps engineers' clubs, etc., might join. The Engineers' Club of New York wants new quarters. Also, if a good many office rooms could be rented to engineers and to architects, so that it would be general headquarters of the engineering branches in this country—

Discussion on
New Society
House.

Mr. CROES.—Would those rooms be for single men only?

Mr. SMITH.—The dormitory question has not been raised yet. I am pointing out some of the advantages. Some people here will point out some disadvantages, I doubt not. I will only say that before we go into this thing and put up a new building, I am in favor of some kind of a committee which shall consider it in its present light—I understand it is an old movement—and see if there is anything in it. If there is not, I am satisfied, and I am satisfied to leave it to our Board of Direction. But now the Members are here, I want to point out these things to them. I don't believe that after 10 years, if such a thing could be carried out, any would be sorry, but we would all be extremely glad that we had gone in that way, where union is strength, where we are all to be together, and where we have these advantages separate and combined, instead of weakened by being scattered.

Mr. T. C. CLARKE.—Mr. President, the question before us is a practical one. It is whether we shall act upon Mr. Herschel's motion, and trust this matter to the wisdom of the Government of the Society, to act in such way as seems best to them, or whether we shall postpone action and appoint a committee to consider the magnificent vision of the future which the gentleman has just described in such eloquent language. For my part, I would rather act now, and leave the matter in the hands of the Government of the Society.

Mr. SMITH.—So would I, Mr. President, and that is why I vote for doing so, but before doing so I wanted the Members to think a little about this, and they can talk to the Board of Direction and influence them all they choose.

Mr. MENDES COHEN.—I have heard the remarks made by Mr. Smith, who is, I believe, a Past President of the Society of Mechanical Engineers, and, therefore, can speak with some knowledge of at least one of the kindred societies. I have long thought that it was a desirable thing if such a joint building could be secured in New York. Not only is it desirable to concentrate the technical libraries of the city in some close connection, not necessarily identical ownership but to bring them closely together; but the several societies need have but one meeting room—no one society will want it very frequently—and, therefore, an arrangement could be made, if such general arrangement proved to be at all desirable, by which the use of the general meeting room could be had without conflict, one with the other, and a building with several suites of apartments suitable for the use of each of the several societies might be had at a rent which would be relative to the accommodation, and, when afforded, it would only be such accommodation as we have ample precedent for elsewhere. If I am not greatly mistaken, what are termed the learned societies of Great Britain, centered in London, are very largely accommodated in one building, Burlington House, with a common theater or general meet-

ing room and suites of apartments for the several societies. It is true that government endowment comes in there in some shape, but that is not a feature which we need discuss here. It seems to me that, before going into an expenditure of money, of some \$125 000 or \$150 000, it may not be amiss to consider whether we cannot make the accommodations to be offered this Society even more ample and, at the same time, so arranged that there shall be a wider distribution of the common expense. I, therefore, very much favor the suggestions which have been presented by Mr. Smith, and it seems to me that the tendency of Mr. Smith's suggestion and of my own views does not conflict at all with leaving the matter in the hands of the Board of Direction, but it would point to suggesting to the Board the desirability of once more considering the possibility of some such arrangement.

Mr. EMERY.—Mr. President, I think at this juncture it would be desirable to hear what success has been had with the new building of the Franklin Institute.

The PRESIDENT.—The President of the Franklin Institute is in the room. He can possibly give us the information.

Mr. JOSEPH M. WILSON.—The Franklin Institute matter is an entirely different thing. The Franklin Institute, perhaps, has organized a trust. It is going to put up a building independent of the Franklin Institute, in one sense. That trust arranges to issue bonds and to obtain money for the purpose of putting up that building, and the Franklin Institute leases the whole building from the trust. The trustees for the building trust must be members of the Board of Management of the Franklin Institute, so as to control the matter in one sense, and an arrangement is made by which ultimately the whole building will be owned by the Franklin Institute. The Franklin Institute will have its own rooms, certain stories appropriated to its use, and an auditorium. It leases the building itself, the different floors that it does not need, and the rent from those come into the Franklin Institute, and by those receipts it runs the building. In the future, if it needs more room, it can take some of those floors, appropriate them one after another, but it is not a division arrangement with other societies at all. Of course, it could lease floors, just like other offices, to other societies.

Mr. BOGART.—Yes. But, Mr. President, I would ask if the Franklin Institute doesn't really own the building and take the risk?

Mr. WILSON.—The Franklin Institute owns the whole thing in the end absolutely.

Mr. ROBERTS.—But uses only a small portion of it.

Mr. WILSON.—Say three floors for the present, and rents out the rest.

Mr. ROBERTS.—That is a million dollar building?

Mr. WILSON.—A million and a half dollars.

Mr. EMERY.—I will ask Mr. Wilson, through the Chair, the general size of the building, so as to get an idea.

Discussion on
New Society
House.

The PRESIDENT.—Mr. Wilson will please state in a rough way the general size and cost of the building.

Mr. WILSON.—The building will be 175 x 132 ft., and 12 stories in height from the pavement.

The PRESIDENT.—What is the estimated total cost, including the ground on which it stands?

Mr. WILSON.—The total cost will be about a million and a half dollars. The upper floor is proposed to be the library, the second floor from the top to be used for the management, the officers, etc. The auditorium is on the first floor.

Mr. ROBERTS.—Do I understand him it is in New York?

Mr. WILSON.—In Philadelphia.

Mr. ROBERTS.—Not in New York?

Mr. WILSON.—Not in New York.

Mr. EMERY.—This brings out the question in the light that I wish to call to the attention of the Society. The builders of these large buildings, those that own them, are able, by getting together a number of plots of land and going ahead in a business way and putting up one of those large buildings, to raise enough money on bonds to pay the cost of the building—very nearly so. I wanted this subject brought out to see whether it was better to consider it. It is not to change the direction of the motion at all, but merely to bring the fact before this Society and the Board of Direction.

The PRESIDENT.—The motion as finally committed to writing by Mr. Herschel is as follows:

New Society
House matter
entrusted to
Board of
Direction.

"That the execution of the scheme outlined by the resolution just passed be entrusted to the Board of Direction of this Society."

That motion is seconded and is before the house. Are there any further remarks?

Mr. OBERLIN SMITH.—Before that question is put, I will just say that it seems to be feasible, so feasible that it ought to be looked into before going into something else, to have a library trust of some kind created, of which this Society and the others should rent the proper apartments; and included in this scheme is, of course, a very large hall, much better than any of us could expect to have alone, suitable to entertain our foreign friends in, which any individual society cannot afford to-day, as mentioned by Mr. Cohen. Of course, it would be a large and beautiful hall. It seems to me that if this library trust could be created, it could be a library without taxation, which our private library, I believe, cannot be. Isn't that the law of the case, Mr. President?

The PRESIDENT.—There are various ways of getting a library without taxation. If that is the question before the house, I think there is one gentleman here who can tell us all about it; but there is nothing in this resolution which calls for a consideration of that matter, and it

seems to me that the debate is getting beyond the limits of the question, and that it would be better either to pass or vote down this resolution and leave this other question to come up subsequently.

Cries of "question."

Mr. SMITH.—All I urge is that the thing be taken into consideration and that the other societies be conferred with. If the Boards of Direction of these societies do not favor and don't want to go into it, this Society ought to go ahead by itself; but if now is the time when the whole thing can be done as one grand affair, instead of a whole lot of little affairs scattered about, weakening all of them, it ought to be done before we go ahead.

The PRESIDENT.—Gentlemen, are you ready for the question? (Cries of "question.") The resolution as made by Mr. Herschel and duly seconded is that the execution of the scheme outlined by the resolution just passed be entrusted to the Board of Direction of this Society.

The motion was adopted.

The PRESIDENT.—It is carried unanimously. Is there any further business to come before this meeting?

Mr. FITZGERALD.—Mr. President, if it is in order I should like to make an announcement in regard to the excursion to-morrow.

The PRESIDENT.—It is not in order to make an announcement in regard to excursions until the other business of this meeting is disposed of. When that is done, an opportunity will be given. Is there any other business before this house?

Past President D. J. WHITTEMORE.—Mr. President, is there to be another Business Meeting of this Society before adjournment?

The PRESIDENT.—There is no provision made for another Business Meeting, but this meeting can, if it sees fit, adjourn to 15.30 to-morrow afternoon, when any business which has been overlooked can be taken up.

Mr. WHITTEMORE.—The thought has struck me that it might be well for the Chair to appoint a committee to draft certain resolutions of acknowledgment of the hospitalities we have received, that committee to report to the Society at a business meeting or a meeting specially called for acting upon it. I put this now. Perhaps it would not cover the entire field, as I suppose there will be an excursion that should be duly acknowledged; but I have seen these things brought up at the last moment, and half done so often that I now would like very much to have it so placed that proper acknowledgments can be made for the courtesies extended by the people of Boston and others to this Society.

The PRESIDENT.—Do I understand that you make a motion to the effect that the Chair appoint such a committee?

Mr. WHITTEMORE.—If it is proper, I will make such a motion, that the Chair appoint a committee of three—perhaps five would be better—of Members.

Motion to
appoint Com-
mittee on
Resolutions.

Motion to
appoint Com-
mittee on
Resolutions.

The PRESIDENT.—The Chair would suggest that it be four.

Mr. WHITEMORE.—To draft appropriate resolutions of our appreciation of the kindness extended by all parties who have extended their hospitality and kindness to this Society at the Convention.

A MEMBER.—I second the motion.

Mr. WHITEMORE.—And to report to a meeting that will be specially called. I understand you can have one Saturday morning for an hour.

The PRESIDENT.—We can.

Mr. WHITEMORE.—By the passage of an appropriate resolution.

The PRESIDENT.—It is moved and seconded that a committee of four be appointed by the Chair to draft resolutions expressing the appreciation of this Society of the various courtesies which it has received, this committee to report at a special meeting of the Society to be held on Saturday morning. Are you ready for the question?

The motion was adopted.

The PRESIDENT.—It seems to the Chair that if no objection is raised it is eminently proper that the four Past Presidents of this Society who are present should constitute that committee.

Mr. WHITEMORE.—One of the Past Presidents will leave on Friday morning, I think, or to-morrow sometime, I cannot state yet when, so he will not be here Saturday.

Committee on
Resolutions
appointed.

The PRESIDENT.—Cannot that Past President do his work before he retires? The committee will therefore consist of the four Past Presidents who are in attendance upon this Convention, Mr. Whittemore, Mr. Worthen, Mr. Cohen and General Craighill. Is there any further business before this Society?

Mr. COHEN.—General Craighill has already been called away.

Announce-
ment of Mr.
Corthell's
papers.

The PRESIDENT.—Then a quorum of that committee will be three. Is there any further business to come before this meeting? The Chair would state that Mr. Corthell wishes to make two statements of interest to this Society, relating especially to communications received from foreign societies, and would prefer to make those statements to-morrow afternoon. Whether those be made before a business meeting or a general meeting, I do not think makes very much difference, but it would be in order, if the Members desire, to adjourn this meeting to meet at 15.30 to-morrow afternoon, and as soon as any business is done, if there is any, we can go on to the consideration of any papers or other matters which may come up.

Mr. COHEN.—I make the motion, sir, in accordance with that suggestion, that we adjourn to such time.

The motion was seconded.

The PRESIDENT.—I will put the motion in a little different form from what it has been made by Mr. Cohen. It is moved that when this meeting adjourns, it adjourn to meet in this room at 15.30 to-morrow.

The motion was adopted.

The PRESIDENT.—Mr. FitzGerald has an announcement to make before the meeting adjourns.

Mr. FITZGERALD.—Mr. President and Gentlemen: As you know, to-morrow we visit the main drainage works and the other sewerage works connected with the city of Boston and the state of Massachusetts. There are two steamers engaged for that excursion, one the *J. Putnam Bradlee* and the other the *Cormorant*. The former is the larger boat, and we find there are so many going on that excursion, so many ladies, that we cannot make the landing at the Old Harbor Point, where are situated the pumps which raise the sewage up into the settling tanks before it passes down through the tunnel to the outlet at Moon Island, to the reservoirs. But as there are undoubtedly many engineers here who are interested in these matters, particularly these pumps, and the tanks, etc., connected with them, the plan has been proposed and will be carried out of asking those gentlemen who are particularly interested in seeing those works as engineers, to take the *Cormorant*. That boat will take 75. Therefore, in view of these circumstances, it is highly desirable that no one will go on the *Cormorant* except those desiring to stop at Old Harbor Point. I think that is all.

Announcement of Excursion in Boston Harbor.

The PRESIDENT.—It is, therefore, as I understand it, Mr. FitzGerald, the wish of the Committee in charge that all ladies shall go on the larger boat?

Mr. FITZGERALD.—On the larger boat.

A MEMBER.—What hour? The same hour?

Mr. FITZGERALD.—The same hour.

Mr. HERSCHEL.—As a gentleman of some experience in navigating this harbor, it strikes me that very likely we will not be here at 15.30 to call the meeting to order, and I would suggest that we hear what Mr. Corthell has to say now.

The PRESIDENT.—It is late in the evening, and Mr. Corthell, we are sorry to say, would find it very difficult to say what he wishes to by the present light, and he has particularly requested that it be postponed.

Mr. HERSCHEL.—Oh, well, of course, I withdraw my motion.

The PRESIDENT.—The Secretary will make an announcement in regard to return tickets over trunk lines.

The SECRETARY.—I wish to announce that to-morrow will be the last day on which a representative of the Trunk Line Association will be here to *visé* the certificates which any Member has purchased in order to secure the one-third reduction in fare for the return trip.

Announcement concerning Trunk Line certificates.

The PRESIDENT.—Is there any further business? If not, a motion to adjourn will be in order.

Adjourned to 15.30 o'clock, June 21st.

Adjournment of First Session.

SECOND SESSION, FRIDAY, JUNE 21ST, 1895, 15.30 O'CLOCK.

Meeting called
to order.

President George S. Morison in the chair; Charles Warren Hunt, Secretary.

The PRESIDENT.—The meeting will come to order. This meeting is an adjournment of the Business Meeting of last evening. A quorum, however, are not yet present, but as there are some other matters to come up, we can proceed with the other matters, and if any business remains, take it up afterward. According to the printed programme, this meeting is reserved for the reading and discussion of Papers Nos. 10, 11, 12 and 13. Papers Nos. 10, 11 and 12 have been read and discussed, but if any gentleman present desires to discuss these papers any further, an opportunity is now given. Has anybody anything to say on Papers Nos. 10, 11 and 12? As I hear no remarks in relation to these papers, and as Paper No. 13 has been read and was also set for an earlier meeting, we will now proceed to any other business which may come before the Society. Has any one any special business to present?

Mr. Corthell
presents paper
on Literary
Product of
International
Engineering
Congress.

Mr. CORTHELL.—Mr. President, Members of the Society: My excuse for having this paper presented at a very late date was illness in a foreign country, inability to get at the material which forms the paper, and not much strength or the use of my eyes sufficiently to do the work when I got at the material. But it was a duty that I felt I owed to the engineering profession in this country and elsewhere. Therefore the paper is presented at this late day. The subject is, "The Literary Product of the International Engineering Congress of 1893."

Proceeding, Mr. Corthell read a paper on this subject (see Appendix A, page 146).

The PRESIDENT.—Mr. Corthell's paper is before the Society.

Mr. PROUT.—It is a very interesting record of a very important episode in the history of our profession. I move that the paper be referred to the Board of Direction, for printing in the proper place in our publications.

The motion was seconded.

The PRESIDENT.—You have heard the motion, that this paper be referred to the Board of Direction, for printing in the proper place in our publications. Are there any remarks to be made? If there are no remarks the question will be put.

The motion was adopted.

The PRESIDENT.—Is there any other business to come before this meeting?

Mr. Corthell
presents paper
on Interna-
tional Engi-
neering Insti-
tute.

Mr. CORTHELL.—Mr. President, I have another communication which I would like to give to this Society and to this meeting on another subject, which is suggested in the paper just read. I wish to say right here, that although it has become a very great desire on my part to

establish in some way closer international relations between the engineers of this world, the proposition which was sent to this Society nearly a year ago, and which possibly some of you may have heard of, if not through the channels of the Society, through the engineering papers and periodicals, was only a suggestion put into concrete form in order that not only engineers here, but engineers abroad, might have something to give their opinion upon and something to criticise. This paper was sent out last July, just as I was going to Europe, and you know that during the last year I have not been able to give very much personal attention to such matters. But it has been on my mind, and I have conducted quite an extensive correspondence when I perhaps ought not to have been doing anything; still, I desired to carry the thing along as far as I could under the circumstances. Since I have returned I have brought together the correspondence, the letters which have been sent to me by engineers in various countries, and have put them in the form of a statement or a paper which I would like to give to this Society. And I will say, too, that although I belong to several societies in this and other countries, I would rather have the good opinion of this Society than any other. That you know. This is a résumé of correspondence from engineering societies relating to establishing closer international relations.

Mr. Corthell then read a paper on this subject (See Appendix B, page 154).

The PRESIDENT.—Gentlemen, you have heard Mr. Corthell's paper. What action do you wish to take?

Mr. CORTHELL.—Mr. President, if I may be allowed to monopolize this meeting, as I seem to be doing, I have in my own mind what I think may be possible to do and what may be impossible to do. I think, from the communications I have had that have not been read here relating to the subject, that the whole matter had better be referred, and, perhaps, more properly referred, to the Board of Direction of this Society, where personally I am perfectly willing to leave it; and, therefore, I make a motion, Mr. President, that the subject covered by this communication be referred to the Board of Direction, with a request that they give the matter careful consideration and action.

Discussion on
proposed International
Engineering
Institute.

The PRESIDENT.—You have heard the motion. Is the motion seconded?

The motion was seconded.

The PRESIDENT.—I believe we are one or two members short of a quorum. The Secretary will be back in a few moments, when, I think, we can put the question.

Mr. FITZGERALD.—Mr. President, in the meantime will it be in order for me to ask Mr. Corthell if he has in his own mind anything outlined, any course outlined, which will bring about such a union as he suggests?

Discussion on
proposed In-
ternational
Engineering
Institute.

Mr. CORTHELL.—I hardly know, Mr. President, what reply to make to that question. Since this proposition was formed in my own mind and written out and printed and distributed, I have had my own views very much changed in regard to what is best, what is feasible, what is possible; and I confess that, considering the conflicting opinions which are given by these various societies and by engineers, the problem is too great for me. What I desired was to initiate the matter, and having confidence in the wisdom and broad ideas and general knowledge of this Society, I would like to leave it entirely with the Board of Direction. What I would like to have done is for the Board to consider it carefully at an early day. I say an early day for the reason that I am in receipt of communications from several societies and individuals in various parts of the world that desire to know what has been done with it, and the time has come when I must give some answer to them. It must be done very soon. Therefore, I would like, if the Board of Direction would so approve, if this motion passes, to consider it carefully at an early day and present the matter to the Society in some form by which the Members can vote upon it, and to obtain the sentiment of the Society, which cannot be very well done in a small meeting at a Convention. I hope that will be the outcome of it if it is referred to the Board of Direction.

Mr. FITZGERALD.—Now, I should like to ask Mr. Corthell to say further if he thinks it is possible for the Board of Direction or for this Society to accomplish anything without communicating with each of these foreign societies?

Mr. CORTHELL.—I think, if the Board of Direction take the action that I have outlined, that the foundation is laid for it sufficiently so that it will carry such weight with foreign societies that it would have good results. Mr. Gleim, for instance, states that "We are very anxious to know what is done at the Annual Convention this year." They know that we are about holding our Convention. They would like to know soon what is done by us here in this country on this proposition. It is a matter of great interest to them. Therefore, I think if this Society would take some action, I hope favorably, upon it through its Board of Direction, and then by the individual Members as soon as the printed report of the Board or its suggestions could be sent out and returns made in the way of a ballot, that this result could be sent abroad, and this Society would take the lead in that case, I am certain, in bringing about some sort of closer international and permanent relations between the engineers of the world. I think the action had better be taken first.

The PRESIDENT.—Gentlemen, the motion before the house is that the subject covered by this communication be referred to the Board of Direction, with the request that they give the matter careful consideration and action. Are there any further remarks? Are you ready for the question? (Cries of "Question.")

The motion was adopted.

The PRESIDENT.—Is there any other business before this meeting?

A MEMBER.—I move we adjourn.

The PRESIDENT.—Before we adjourn, it ought to be stated that the program calls for a meeting at 9 o'clock to-morrow, and, while that meeting is not likely to be long, it is probable that there will be a little important business to be transacted. I think, therefore, that the first motion should be a motion that when this meeting adjourns, it adjourn to meet at 9 o'clock to-morrow morning. Will some gentleman make that motion?

Mr. KNAP.—I make that motion.

The motion was seconded.

The PRESIDENT.—It is moved and seconded that when this meeting adjourns, it adjourn to meet in this room at 9 o'clock to-morrow morning.

The motion was adopted.

The PRESIDENT.—Is there any other business? If not, a motion to adjourn will be in order.

Adjourned to 9 o'clock, June 22d.

Adjournment
of Second
Session.

THIRD SESSION, SATURDAY, JUNE 22D, 9 O'CLOCK.

President George S. Morison in the Chair; Charles Warren Hunt, Secretary.

The PRESIDENT.—The meeting will please come to order. This is an adjourned Business Meeting, adjourned from yesterday afternoon. Meeting called to order.
Is there any special business to come before this meeting?

Past President W. E. WORTHEN.—I have a report to make.

The PRESIDENT.—Mr. Worthen will make the report that he has to present.

Mr. WORTHEN offered the following:

"Resolved, That the thanks of the American Society of Civil Engineers are hereby tendered to C. P. Clark, Esq., President, and to the New York, New Haven and Hartford Railroad Company, for the special trains kindly furnished for the conveyance of its Members from New York City to the Hotel Pemberton, and from the Hotel Pemberton to Plymouth, as well as for the numerous daily transportation facilities at Nantasket, which have added so largely to the convenience and pleasure of the Convention."

Resolution of
thanks to the
New York,
New Haven
and Hartford
Railroad Com-
pany.

The PRESIDENT.—It seems to the Chair that it will be more emphatic if each of these resolutions is acted on separately. These resolutions are submitted by the Special Committee appointed for the purpose. A motion is in order that this resolution be adopted.

Mr. FITZGERALD.—I so move, Mr. President.

The motion was seconded. The resolution was adopted.

Mr. WORTHEN offered the following:

Resolution of
thanks to the
officials of the
Boston and
Maine Rail-
road Company.

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to Lucius Tuttle, Esq., President, T. A. Mackinnon, General Manager; and other officials of the Boston and Maine Railroad Company, for the special train which has been arranged for the pleasure and convenience of the Society to convey its Members from Boston to the Crawford House and return."

Mr. FITZGERALD.—I move the adoption of that resolution.

The motion was seconded.

The motion was adopted.

Mr. WORTHEN offered the following:

Resolution of
thanks to C. E.
Barnes, Esq.,
and to J. C.
Sanborn, Esq.

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to C. E. Barnes, Esq., Superintendent of the Plymouth and Kingston Electric Street Railway, and to J. C. Sanborn, Esq., Superintendent of the Plymouth Division of the New York, New Haven and Hartford Railroad, for the courtesies extended to the Society and to its Members individually on the occasion of the visit to Plymouth on June 20th, 1895."

The PRESIDENT.—Gentlemen, you have heard the resolution. Is it your pleasure that it be adopted?

Mr. FITZGERALD.—I so move, Mr. President.

The motion was adopted.

Mr. WORTHEN offered the following:

Resolution of
thanks to
Hon. Edwin U.
Curtis.

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the Hon. Edwin U. Curtis, Mayor of Boston, Mass., for the facilities afforded for the inspection of the interesting Park System and the magnificent Harbor of the city of Boston, which was so thoroughly enjoyed by all its Members."

The PRESIDENT.—You have heard the resolution. What action will you take?

Mr. FITZGERALD.—I move its adoption.

The motion was adopted.

Mr. WORTHEN offered the following:

Resolution
of thanks to
Bertrand T.
Wheeler, Esq.

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to Bertrand T. Wheeler, Esq., Superintendent of the Street Department, Boston, Mass., for the use of the steamer *Cormorant* and for other facilities kindly tendered by him, which have added much to the convenience and pleasure of the Annual Convention of 1895."

The PRESIDENT.—It is moved and seconded that the resolution of thanks to Mr. Wheeler just read be adopted.

The motion was adopted.

Mr. WORTHEN offered the following:

Resolution of
thanks to West
End Street
Railway Com-
pany.

"*Resolved*, That the thanks of the American Society of Civil Engineers are hereby tendered to the West End Street Railway Company for the various courtesies in the matter of transportation accorded to the Society during this Convention."

The PRESIDENT.—Gentlemen, you have heard the resolution. Do you wish to adopt it?

Mr. FITZGERALD.—I move its adoption.

The motion was seconded and adopted.

Mr. WORTHEN offered the following:

"Resolved, That the thanks of the American Society of Civil Engineers are hereby tendered to the Board of Metropolitan Sewer Commissioners for the courtesies extended to the Society on the occasion of its visit made to the works under their charge, which proved so interesting and instructive."

Resolution of thanks to Board of Metropolitan Sewer Commissioners.

The PRESIDENT.—Gentlemen, you have heard the resolution. What action will you take?

Mr. FITZGERALD.—I move its adoption.

The motion was seconded and adopted.

Mr. WORTHEN offered the following:

"Resolved, That the thanks of the American Society of Civil Engineers are hereby tendered to the Boston Society of Civil Engineers and to the Local Committees in charge of the arrangements for this Convention, in recognition of the efficient manner in which the program in all its details has been planned and executed."

Resolution of thanks to Boston Society of Civil Engineers.

The PRESIDENT.—Gentlemen, you have heard the resolution.

Mr. CROES.—I move its adoption by a rising vote.

The motion was seconded and was adopted as suggested.

Mr. SMITH.—There is one more resolution that ought to be adopted, I suppose that has been accidentally omitted, to Major Livermore and the Light House Board.

Mr. FITZGERALD.—Will Mr. Smith allow me to make a suggestion:

That the thanks of the Society be extended to Major Livermore and to Commanders F. M. Green and H. G. Colby of the United States Navy for courtesies extended to this Society during the Convention in kindly offering and taking a party to Minot's Ledge yesterday.

I will put that in shape.

The PRESIDENT.—Do you offer that as a resolution?

Mr. FITZGERALD.—I do.

Mr. SMITH.—I move its adoption.

The PRESIDENT.—The Chair would suggest a change in that to read Major Livermore of the United States Army and the other officers of the United States Navy.

Mr. FITZGERALD.—Yes, I will put that in shape, Mr. President.

The motion was seconded. The resolution was adopted. As finally drawn, the resolution reads as follows:

"Resolved, That the thanks of the American Society of Civil Engineers are hereby tendered to Major W. R. Livermore, United States Army, and to Commanders F. M. Green and H. G. Colby, United States Navy, for courtesies extended to this Society during the Annual Convention."

Resolution of thanks to Major Livermore and Commanders Green and Colby.

The PRESIDENT.—Is there any further business? Are there any announcements to be made? If there is no further business and there are no announcements to be made, a motion to adjourn is in order.

A MEMBER.—I move to adjourn.

The PRESIDENT.—A motion is made to adjourn. I would have you appreciate the gravity of the occasion, because if we adjourn it is the end of this Convention.

Final adjournment of Annual Convention.

Adjourned.

APPENDIX A.

THE LITERARY PRODUCT OF THE INTERNATIONAL ENGINEERING CONGRESS OF 1893.

By E. L. CORTHELL, M. Am. Soc. C. E.READ JUNE 21ST, 1895.

The writer desires to present some notes regarding the publication of the proceedings of the International Engineering Congress, held in Chicago in 1893.

The history of the congress is so well known that it is unnecessary to do more here than to allude to a few matters of interest which may not have come to the notice of the professional journals of this and other countries, or that of the officers of various societies at home and abroad upon whom has devolved the duty of compiling the facts upon the subject. Possibly some of the facts which the writer has in hand to state may be found in London *Engineering*, which, through its correspondent in New York, gave a quite complete history of the congress. An account of it was also published in *The Engineering Magazine*. Other journals, *Engineering News*, *The Railroad Gazette*, *The Engineering Record*, etc., have also given the essential facts. In editing the proceedings of the congress, each division has alluded at least to its inception and history.

For the benefit of all interested, the writer, who had much to do with the preparations for the congress, will put on record some facts which may not have been published.

The Congress of Engineers was conceived, proposed and preliminary steps for it taken before it was known by those interested that any other congresses were to be held during the exposition. The engineers, both in this and other countries, went about the preparation very early and in a business-like manner, which cannot but reflect great credit upon the profession and entitle it to just pride in the work and its results. The laying out of the work and its distribution among those best qualified to manage the different divisions of engineering are too well known to require any further notice.

The question arose early among those who were managing the work, both in Chicago and elsewhere, of what should be done if the World's Congress Auxiliary, which had undertaken the general management of the series of congresses, should fail to make its promise good to provide the means for conducting the congresses and printing their proceedings. After some correspondence and conference the opinion became general that the arrangements for the engineering congress should include that of publishing, so that if the Auxiliary should fail the

valuable results of our congress would not go into pigeon-holes or packing boxes. It was considered a duty to the authors of papers at home and abroad to furnish them, at least, with printed copies of the proceedings and transactions. Arrangements looking to publication were therefore made at least a year before the congress was held. During two years at least before the opening of the congress a very extensive correspondence was carried on with engineers and societies in all parts of the world for the purpose of preparing papers on the numerous subjects embraced in the seven divisions of engineering. The committee in Chicago corresponded with 27 different countries and probably the range of the correspondence of the various divisions was nearly as great, for the address lists were interchanged from time to time between them and the general committee. In the meantime prominent engineers in other countries, friendly and helpful, were bringing the matter to the attention of the profession. It will not in any sense be invidious to say that eminent in this work stood the editor of *Engineering*, James Dredge, Esq., the honorary president of the congress, and C. O. Gleim, Corresponding M. Am. Soc. C. E. of Hamburg, Germany; the former, by his great journal, by correspondence and by personal conference and public addresses, stirred up an interest in the congress in all the branches of engineering all over Great Britain, and it may be said in the entire civilized world, or wherever *Engineering* is read. Mr. Gleim, as the committee of one to whom was delegated by the council of the German Association the correspondence with the United States committees and societies, worked unceasingly to spread in Germany a full and correct idea of the congress and to create a special interest in it. The analysis of the literary work accomplished by the congress, to be made further on, will show how faithfully and effectively these two men worked for the congress.

To illustrate the systematic and business-like methods and forehandedness of the engineers an incident is worth mentioning. Early in 1892 the writer was in Washington with President C. C. Bonney of the World's Congress Auxiliary to obtain from the committees of Congress having exposition matters in charge favorable reports on the question of appropriation for printing the proceedings of the congresses. It was important to explain the plans of the auxiliary to the leading scientific men of Washington, who had not up to that time fully understood the scope and importance of the work. By invitation, about 20 of them met in the rooms of Major Powell, Director of the Geological Survey; they were all leading scientists and educators of national reputation, Messrs. Mendenhall, Goode, Harris, Eaton, Newcombe, Powell and others. The writer, who was to be present, had invited Commodore George W. Melville, Chairman of the Division of Marine Engineering and Naval Architecture of the Engineering Congress, and Mr. McFarland, Secretary of that division. President

Bonney was called to preside over the meeting. After brief remarks outlining the general scheme of the congresses he stated that they were fortunate in having present the Chairman of the General Committee of the Engineering Congress, for the engineers had already accomplished an assured success, and he, President Bonney, could not better illustrate what steps should be taken in forming the plans for the scientific and educational congresses than by placing before the meeting the very complete and satisfactory plans of the engineers; and then called upon the writer to state them. Fortunately for the writer and the meeting, it was his privilege, after outlining the plan of the Engineering Congress, to call upon Commodore Melville to illustrate the plans and methods by relating the steps taken by his division. After a few remarks of a general nature he called upon his secretary, Mr. McFarland, who had come with his large address book. From it he gave the names of the experts of international reputation who were serving as honorary presidents of the Naval Division or upon its Advisory Council or had written or were writing important papers on the great naval questions of the day. Each name was accompanied by a brief statement of rank, position and experience. On the breaking up of the meeting, sincere and hearty were the congratulations by the distinguished and appreciative scientists, with the remark, "You have already succeeded." The three engineers look back upon that meeting as one of the proudest moments of their lives, and the standing of the profession was there placed another notch higher.

Passing over the sessions of the congress it should now be stated that the United States Congress refused utterly to expend a dollar in printing the proceedings of the congresses. The engineers were thus thrown back upon their own resources. It is however an engineer's business to be always resourceful, and there could be no exception to the rule now. It was arranged. It had been already arranged that the proceedings of the Divisions of Civil, Mechanical, Mining and Metallurgical Engineering should be printed by the three national societies, and that the newly formed Society of Engineering Education, the outgrowth of the Congress, should print the proceedings of that division; but the Naval and Military Divisions, conducted by Commodore Melville and by Major Clifton Comly, respectively, found themselves with no financial assistance whatever. Commodore Melville at one time seriously considered the idea of appealing to the great ship-building concerns of the country, but a wiser course was found by printing the proceedings through the publishing house of John Wiley & Sons of New York. So valuable were the papers of this division that three publishing houses offered to print them.

At one time there seemed to be disaster before the Military Division, as Major Comly suddenly died before the arrangements for printing were consummated, and Lieutenant H. F. Harris, the secretary of

the division, was tied by military regulations, unable to move the matter forward, and could only edit the papers, prepare them for printing and file them with the War Department. In June last, the writer was in Washington partly on this business, determined to do everything that was possible to bring out what was well known to be very important and valuable papers contributed to the congress not only by our own military men, but by those of several foreign countries. He went directly to the Secretary of War, Mr. Lamont, personally laid the case before him and asked his assistance, but was met by the discouraging fact that, on account of the decidedly adverse opinion of Congress, the heads of Government departments had agreed together not to print or ask of Congress to print any of the proceedings of the congresses. There was nothing to do, therefore, but to go directly to Congress itself, which the writer did at once, appealing to Senator (General) Manderson, member of the Joint Committee on Printing, stating to him personally and earnestly all the facts and making plain to him the obligation of our Government to print and distribute the proceedings of the Military Division of the Engineering Congress. The Senator agreed to offer a joint resolution to authorize the printing of these papers. The matter, however, did not end there; it required personal attention, effort, and watchfulness until nearly the close of the session, and the writer at last cabled Senator Manderson from Switzerland, reminding him of the desired passage of the joint resolution. It was passed, and 1 000 copies printed and distributed.

The writer, having been able to get together the proceedings of the Engineering Congress, takes satisfaction in the nine solid volumes of printed matter, not mentioning the Aerial Navigation Conference and the Water Commerce Congress, related to the Engineering Congress.

The writer has made an approximate analysis of the nine volumes above mentioned, and gives it as a matter of general interest. These volumes are distributed as follows:

Division A. Civil engineering, printed by the American Society of Civil Engineers. 2 volumes.

Division B. Mechanical engineering, printed by the American Society of Mechanical Engineers. 1 volume.

Divisions C and D. Mining and metallurgical engineering, printed by the American Institute of Mining Engineers. 2 volumes.

Division E. Engineering education. Printed by the Society for the Promotion of Engineering Education. 1 volume.

Division F. Military engineering, printed by the United States Government. 1 volume.

Division G. Marine engineering and naval architecture, printed by John Wiley & Sons, New York. 2 volumes.

The summary of the analysis of the matter contained in these volumes is given in the following table:

ANALYSIS OF VOLUMES OF PAPERS READ BEFORE THE
INTERNATIONAL ENGINEERING CONGRESS
AT CHICAGO IN 1893.

DIVISION A.—CIVIL ENGINEERING.

Number of papers from each country.	NUMBER OF PAGES.		Number of plates not paged.	
	Paper.	Discussion.		
United States.....	17	503	205	44
France	2	118	.....	9
Great Britain.....	3	134	23	3
Germany	17	315	17	46
Portugal.....	3	38	.....	.....
New South Wales.....	1	31	.....	2
Mexico	4	45	.....	5
Austria.....	1	37	.....	1
Canada.....	1	12	6	.....
Argentine Republic.....	1	19	.....	2
Holland	2	33	.....	4
Eleven countries.....	52	1 285	251	116

DIVISION B.—MECHANICAL ENGINEERING.

United States.....	14	528	.....	8
Belgium	1	11	.....	.....
Germany.....	9	179	.....	9
Holland	1	13	.....	.....
France	1	28	.....	.....
Great Britain.....	1	51	.....	.....
Austria.....	1	43	.....	.....
Seven countries.....	28	853	.....	17

DIVISIONS C AND D.—MINING AND METALLURGICAL ENGINEERING.

United States.....	21	588	257	15
France.....	5	195	.....	.....
Great Britain.....	4	106	11	.....
Germany.....	3	48	1	14
Sweden	1	25	.....	.....
Austria.....	2	203	.....	.....
India.....	1	2	.....	.....
Seven countries.....	37	1 167	269	29

DIVISION E.—ENGINEERING EDUCATION.

United States.....	15	216	62	.....
Great Britain.....	1	20	.....	.....
Switzerland.....	.....	.....	1	.....
Three countries.....	16	236	63	.....

DIVISION F.—MILITARY ENGINEERING.

Number of papers from each country.	NUMBER OF PAGES.		Number of plates not paged.
	Paper.	Discussion.	
United States..... 21	338	.....	65
Great Britain..... 11	199	.....	39
Germany..... 2	25	.....	.....
Switzerland..... 1	8	.....	.....
Sweden..... 1	10	.....	2
France..... 1	109	.....	.....
Mexico..... 7	164	.....	14
Seven countries..... 44	853	.....	120

DIVISION G.—MARINE ENGINEERING AND NAVAL ARCHITECTURE.

United States..... 20	548	119	84
Great Britain..... 11	250	33	18
Germany..... 4	114	1	20
Spain..... 3	36	5	4
Italy..... 5	178	2	25
Five countries..... 43	1 126	160	151

GENERAL SUMMARY.

United States..... 110	2 719	767	216
Great Britain..... 21	760	64	63
France..... 9	452	.....	9
Germany..... 35	681	19	75
Portugal..... 3	38	.....	.....
New South Wales..... 1	31	.....	2
Mexico..... 11	209	.....	19
Austria..... 4	283	1	1
Canada..... 1	12	6	.....
Argentine Republic..... 1	19	.....	4
Holland..... 3	46	.....	.....
Switzerland..... 1	8	.....	.....
Sweden..... 2	35	.....	2
Spain..... 3	36	5	4
Italy..... 5	178	2	25
India..... 1	2	.....	.....
Belgium..... 1	11	.....	.....
Seventeen countries..... 210	5 520	864	420

GRAND SUMMARY.

Seventeen countries furnished 210 papers, containing:

5 520 pages of original papers,
 864 pages of discussion,
 420 plates, besides paged plates, making
 6 804 pages and plates, grand total.

The writer desired to present facts also relating to the other congresses, and wrote to President Bonney for the necessary information. A copy of so much of his letter, dated June 4th, 1895, as relates to this subject is given in the following :

"While, as you are well aware, I have thus far failed to obtain from our Government the means to print an edition of the proceedings of the World's Congresses for distribution to other governments and to colleges of the United States and leading public libraries, nearly all the departments have shown their vitality and vigor by publications often procured under the most discouraging circumstances, and with great self-denial on the part of those who were immediately interested.

"Taking the departments in their chronological order, the publications now stand as follows :

"Woman's Progress, 2 volumes ; Public Press, no publication ; Medicine, 3 volumes ; Temperance, 4 volumes ; Moral and Social Reform, 5 volumes ; Commerce and Finance, 4 volumes ; Music, no publication ; Literature, Society Transactions, 3 volumes ; Education, 6 volumes ; Engineering, 9 volumes ; Art, 2 volumes ; Government, 1 volume ; General Department, 3 volumes ; Science and Philosophy, 8 volumes ; Social and Economic Science, no publication ; Labor, no publication ; Religion, 18 volumes, besides some newspaper publications ; Sunday Rest, 1 volume ; Public Health, 1 volume ; and Agriculture, 4 volumes ; total, 74 volumes. Of the 18 volumes in the Department of Religion, seven are on the Parliament of Religions. Some of the publications are incomplete. It is estimated that they amount to about 33 000 pages of printed matter.

"The interest in the work has by no means died away, but is rather on the increase, as I judge from communications oral and written which come to me from all points."

From the facts above given it will be seen that the Engineering Congress printed 6 804 pages of the 33 000 pages that have up to date been printed by the whole series of congresses, embracing 18 departments holding 18 congresses. With the exception of the Congress of Religion, the Engineering Congress has issued more volumes than any other congress, and it must be borne in mind that the great departments of Education and Religion embraced hundreds of thousands of people from many lands, especially that of Religion, exciting as it did the deepest interest in all civilized countries.

No statement in regard to this great series of congresses is complete without giving to the president of the World's Congress Auxiliary, the Hon. C. C. Bonney, the credit for much of the success and permanent benefit arising from them. The writer was at one time, and perhaps the most trying in the history of the work, intimately associated with President Bonney as an officer of the Engineering Congress, and was personally conversant of the unremitting efforts, the consummate tact, the urbanity and the cordial helpfulness given to all departments by this man, so peculiarly fitted for the remarkable, unusual and extremely difficult work of which he had entire charge. The learned professions, science, literature, education and religion and the

entire civilized world owe him a debt of gratitude and distinguished consideration and high appreciation.

The value of the literary product of the first International Congress of Engineers cannot easily be overestimated. The busy practical experts, men of affairs of these 17 countries, of the world, laid aside their absorbing work for a time and gave to the engineering profession and to the world the benefit of their valuable experience in all kinds of engineering work. These nine volumes form a cyclopædia of engineering of the greatest value and should be upon the library shelves of every engineer.

The professional and social results were also of the greatest benefit. By personal contact and by much correspondence we have become acquainted with the engineers of other countries to an extent not possible in any other way.

The results obtained are well worth the cost. It is difficult to estimate what this cost has been to the engineers of this country. Including the cost of the headquarters, established and operated by the engineers of this country and Canada, the entire cost does not fall far short of \$50 000. Some idea of the labor involved in the work of the different divisions may be formed from the fact that in the Division of Marine Engineering about 1 000 letters were sent out and nearly 800 replies received.

The success of the congress and the headquarters and the personal acquaintances formed have created a desire, not only in this, but in other countries, for the establishment of more intimate and permanent relations between the engineers of the civilized world.

The writer in a suggested plan to accomplish this, sent out during the last year to individuals and societies in many countries, has endeavored to give tangible form to this desire.

APPENDIX B.

RÉSUMÉ OF CORRESPONDENCE FROM ENGINEERING SOCIETIES RELATING TO ESTABLISHING CLOSER INTERNATIONAL RELATIONS.

By E. L. CORTHELL, M. Am. Soc. C. E.READ JUNE 21ST, 1895.

The International Engineering Congress held at Chicago in 1893 created the desire, or, perhaps more correctly stated, strengthened the desire already existing, to unite in closer social and professional relations the engineers of the world.

The writer, who had taken note of this desire in his official correspondence, endeavored to give expression and form to it in a proposition dated July 7th, 1894, to establish the International Institute of Engineers and Architects. It will be sufficient now to give simply the objects of the Institute as stated in the printed prospectus, copies of which were placed in the hands of the Secretary last summer. Members of the Society have no doubt been made acquainted with its provisions through the engineering papers. The following are the objects as stated in the proposition:

"First.—To unite in closer relations all departments of engineering and architecture.

"Second.—To furnish a suitable and convenient channel by which information relating to new discoveries, processes, methods, inventions, and works may pass from one country to all other civilized countries of the world for the benefit of the profession and of mankind.

"Third.—To conduct, by the assistance of the Fellows of the Institute, individuals and governments, systematic and thorough tests of all classes of materials used in constructive work, and to disseminate through the channel of the Institute the resulting information."

The societies which have considered the proposition and disapproved of it in its present form at least, are:

First.—The Swedish Technical Society of Engineers and Architects at Stockholm. This Society considered the matter with much interest at several meetings, but while the general idea of forming an Institute of this kind was attractive, the Society concluded that it could not favor the proposition as it was presented, as it was lacking in details as regards the organization and proposed working of the Institute.

Second.—The American Institute of Mining Engineers through its Secretary, Mr. R. W. Raymond, who states that there is no way of bringing the subject before the Institute or its Council. Personally the scheme did not strike the Secretary favorably. The Society would either be weak or would weaken existing organizations, nor did he think the United States was as well situated as England as the center of the International Society, nor did he think the scheme of publication could be carried out by the money provided by the proposed dues nor with twice that amount.

Third.—The Federated Institution of Mining Engineers and the North of England Institute of Mining and Mechanical Engineers, both institutions having the same Secretary and domicile, Newcastle-upon-Tyne, England. The propositions had been considered by the Councils of these Institutions and they were unable to approve the scheme.

Fourth.—The South Staffordshire Institute of Iron and Steel Works' Managers, England. The Institute as an institute cannot join the proposed institute, but they wish it every success and hope that when it is established it may be possible to arrange for an exchange of transactions.

Fifth.—The Institution of Electrical Engineers, London, England. The Council instructed the Secretary to say that they scarcely think the time is yet ripe for the establishment of such an institution as the one proposed.

Sixth.—The Mining Institute of Hamilton, Scotland.

Of these seven societies, five do not approve; two, while favoring the general plan, do not approve it in its present form.

The societies* which have considered and approved of forming closer international relations on the plan proposed, or some modification of it, are as follows:

First.—Engineering Society, Tokyo, Japan. The Secretary expresses his approval of the proposition and states that it has been reported to the members.

Second.—B. H. Wallin, civil engineer in charge of tests, Chalmers' Institute, Gothenburg, Sweden. The writer has had considerable correspondence with him, and Mr. Wallin offers his services in Sweden to further the proposed institute. He is a member of many societies in Sweden. He states that the proposition was laid before the Technical Society of Gothenburg for discussion, but consideration was postponed until a committee should have reported upon the subject of a national federation of engineering societies in Sweden. The proposition, how-

* In some cases where the societies have not come to a conclusion the letters of the secretaries are used, and where societies or secretaries have not been heard from, the letters are used which have been received from influential engineers who may be considered representative of engineering opinion.

ever, for the International Institute had been circulated throughout the country by two of the leading engineering journals.

Third.—Mr. A. S. Seaton, civil engineer, Earles Ship-Building and Engineering Company, Hull, England. He agrees generally to the scheme, but thinks the doorway to it is too broad.

Fourth.—Mr. P. Caland, civil engineer, The Hague, Holland, who agrees fully in general with the proposition and specially requested that the writer should bring it to the attention of the Royal Institution of Engineers.

Fifth.—Commodore George W. Melville, Chief Engineer U. S. Navy, late Chairman, Division G, Marine Engineering and Naval Architecture, International Engineering Congress, who is in full sympathy with the scheme and desirous of furthering its interests; who sees but one obstacle, and that is the existence in this and many foreign countries of technical societies.

Sixth.—The Association of German Architects and Civil Engineers, through Mr. C. O. Gleim, civil engineer, Hamburg, Corresponding M. Am. Soc. C. E. The writer placed the proposition before the Annual Convention of this Association last September, at Strasburg, and Mr. Gleim was delegated to transmit the opinion of the Association. The object of the proposition has the full sympathy of the Association, but it is not thought that an International Institute would be the right way to obtain it, at least for the present, particularly on account of the lack of personal acquaintance between engineers of the different countries, and for the present it is thought preferable to limit the scope of the movement and to follow up the course as inaugurated in 1893, by a repetition of international congresses, leaving to the future the development of the question whether these congresses will gradually grow into a more permanent organization. The letter of Mr. Gleim fully develops this idea and is given in full in Appendix C.

Seventh.—Claude William Kinder, engineer-in-chief and inspector of the Imperial Railways of North China, M. Am. Soc. C. E., who considers the proposed institution a most excellent idea and suggests that the domicile of the institution should be in Switzerland, and gives the reasons for the statement.

Eighth.—General Casimiro de Bona, inspector-general of engineers of the Spanish Armada, Madrid, Spain. He approves of the proposition, considering it beneficial to science in general, and especially to the profession of engineering, and desires to be kept informed of the development of the project and to become a Fellow of the institute.

Ninth.—Colonel Nabor Soliani, Italian Navy, who took a prominent part in the Marine Division of the International Engineering Congress at Chicago. He had the proposition translated into Italian and published in the *Rivista Marittima*, and subsequently distributed

it widely through Italy in pamphlet form. The final decision of Colonel Soliani is given later in connection with that of another prominent engineer.

Tenth.—Association of Engineers, Ghent, Belgium, which requests through its Secretary information in regard to the institution and the conditions for affiliation with it, either by the association or by its individual members.

Eleventh.—Canadian Society Civil Engineers. The proposition was considered by the Council and recommended to the favorable consideration of the Society.

Twelfth.—American Institute of Architects. The proposition was considered at a meeting of the Board of Directors on June 3d, 1895, and by a vote of the Board the Secretary was directed to express its approval of the plan presented, and the Board desires to aid in promoting the purposes of the proposed institute.

Thirteenth.—Royal Institute of Engineers, The Hague, Holland, which takes great interest in, and recognizes the comprehensive purpose of, the institute, and desires to be informed in due time of the results which the proposition may have had.

Fourteenth.—The Association of Engineers and Architects of Mexico. This association has given the subject very careful consideration. It translated the proposition into Spanish with the accompanying letter and submitted the question to a special committee, which reported at length to the association assembled in extraordinary session. The report of the committee was approved without change, which approved of the formation of the institute, and called attention to the delay that might result in the proposed method of publication of the papers. The report suggests the addition of a Division of Geodesy and Astronomy and recommends Boston, Mass., as the domicile of the central office of the institute.

Fifteenth.—The Society of Civil Engineers of France. The Society translated the proposition into French and gave a copy to each of the 30 members of its Council. It directed the President to transmit a resolution upon the subject, which was to the effect that, after very careful consideration of the project, it is considered that the most useful result would be obtained by studying it in a plenary assembly of the various societies interested, and the Council further considers that the favorable time for taking up the question by the engineers and architects of the world will be during the Exposition of 1900, when international congresses will be held. At that time the Society will undertake the discussion of the project, which presents without any doubt questions of great interest.

Sixteenth.—Civil and Naval Engineers of Italy. The writer has had considerable correspondence with Colonel Soliani, above mentioned, and with Chevalier Luigi Luiggi, civil engineer, well known in this

country. The writer met Chevalier Luiggi in Genoa, in April, 1895, and exchanged views in regard to the proposed International Institute. Since that time Chevalier Luiggi and Colonel Soliani have been in conference and have conferred with the leading engineers of the Royal Corps of Naval Engineers and with leading individual engineers, with the result that the Italian engineers believe that a federation of existing engineering societies would be most desirable and most feasible, and that this plan would be the only one sure of success in Italy, as it would give the same results, leave each society free, and at the same time unite all engineers in a whole federation. As to the aristocracy of societies, which is more or less strict in the admission of members, the Italians would waive it. "All engineers are for us colleagues and equal." Chevalier Luiggi is also Secretary of the Department of Public Works and engineer-in-chief of civil engineers of the government.

The communications referred to above show that so far as countries and societies have formed opinions upon this subject under consideration, the consensus of opinion is favorable to the general plan, and brings forward three methods of accomplishing the purpose of the proposition, namely: First, either on the lines laid down in the proposition; or second, by an international federation of engineering societies; or third, by a series of international congresses.

The correspondence, or so much of it as is of importance, is given in Appendix C, and the information in this paper is given by the writer in the hope that at the annual conventions this year the national societies will, at least, take some preliminary action upon the question.

APPENDIX C.

COPIES OF LETTERS REFERRED TO IN APPENDIX B.

A. DISAPPROVE.

1. SWEDISH TECHNICAL SOCIETY OF ENGINEERS AND ARCHITECTS.
STOCKHOLM, February 26th, 1895.

Dear Sir,—Svenska Teknologföreningen (the Swedish Technical Society of Engineers and Architects) received your proposition for an International Institute of Engineers and Architects, and with much interest considered the matter at their several meetings.

How grand the idea of forming an institute of this kind may be, the Society have concluded, however, not to favor the same, considering that the proposition, as it is laid forth, is lacking in its details as regards the organization and proposed working of said Institute.

On behalf of the Svenska Teknologföreningen.

AD. AHLSELL, *President*.

MARTIN BORGSTEDT, *Secretary*.

2. AMERICAN INSTITUTE OF MINING ENGINEERS,
13 BURLING SLIP, NEW YORK CITY,
August 20th, 1894.

Dear Sir,—Your circular of July 7th, relative to an International Institute of Engineers, is at hand. There is no way in which this subject could be acted upon by the Institute as a body or by its Council, as it is quite outside the sphere of both.

So far as my personal opinion is concerned, I will say frankly that the scheme does not strike me favorably. I fear that the proposed society would either be weak itself, or else weaken our existing organizations. I do not think the United States so well situated as England as the center of an international society; and I am entirely convinced that the scheme of publications proposed could not be carried out with the money provided by the proposed dues, or with twice that amount.

Yours truly,

R. W. RAYMOND, *Secretary*.

3. FEDERATED INSTITUTION OF MINING ENGINEERS,
NEWCASTLE-UPON-TYNE, ENGLAND,
October 22d, 1894.

Dear Sir,—I submitted your circular letters of July 7th, respecting the proposed International Institution of Engineers and Architects, before the Council of this Institution, and they regret that they are unable to approve the scheme.

Yours faithfully,

M. WALTON BROWN.

- NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS,
NEWCASTLE-UPON-TYNE,
August 23d, 1894.

Dear Sir,—I am in receipt of your circular letter of the 7th July, with enclosure, and will submit it to the Council of this Institution in

due course. This Institution is connected with the Federated Institution, which is based on similar lines to your proposed scheme, so far as it relates to Mining and Metallurgical Engineering and the allied industries.

Yours faithfully,
M. WALTON BROWN.

NEWCASTLE-UPON-TYNE,
September 20th, 1894.

Dear Sir,—I laid your correspondence respecting the International Institute of Engineers and Architects before the recent meeting of the Council of this Institute and they regret that they cannot approve of the suggested scheme.

Yours faithfully,
M. WALTON BROWN.

4. THE SOUTH STAFFORDSHIRE INSTITUTE OF IRON AND STEEL WORKS' MANAGERS.

ALWEN STREET, WORDSLEY, NEAR STOURBRIDGE,
ENGLAND,
September 4th, 1894.

Dear Sir,—Your circular letters of the 7th of July last have been laid before the Council of this Institute, and in reply I am directed to say that they cannot, as an Institute, join the proposed International Institute of Engineers and Architects.

At the same time they wish you every success, and hope that when the proposed Institute is established it may be possible to arrange for an exchange of Transactions.

I am, dear sir, yours faithfully,
WILLIAM H. CARDER, *Secretary*.

5. THE INSTITUTION OF ELECTRICAL ENGINEERS,
VICTORIA MANSIONS, 28 VICTORIA STREET,
LONDON, ENGLAND, S. W.
November 3d, 1894.

Dear Sir,—Your circular-letter of the 7th July in reference to the proposed organization of an International Institute of Engineers and Architects was received by me during the Recess, and it is only now that I have had an opportunity of submitting it to our Council, and I am instructed to say that they scarcely think the time is yet ripe for the establishment of such an Institution.

I am, dear sir, yours faithfully,
F. W. WEBB, *Secretary*.

6. MINING INSTITUTE OF SCOTLAND,
HAMILTON, SCOTLAND,
August 23d, 1894.

Dear Sir,—I have received your circular of 7th July as to your proposals for an International Institute of Engineers and Architects, and inviting criticisms thereon.

I question the advantage of centralization to the extent indicated in your scheme. There may be some advantage in a large membership from which to draw for funds to carry on some exceptional experiment

or investigation; but I am of the opinion that in the writing and discussion of papers better results are as a rule to be got where the membership is limited and local, because a great many subjects of much practical value have only a local application, and a large central institute would not be likely to get the benefit of papers on such subjects.

I fear that by the time papers were distributed and the discussions collected from all parts of the world the subject would in many cases be stale.

I also fear that the amount of subscription is insufficient to cover all the expenditure necessary in your scheme as sketched.

I presume your project implies absorption of the American Institutes and probably others, and not merely federation. I presume you are aware that the greater number of the institutes of this country are now federated. There do not seem to me to be such manifest advantages in your proposal as should induce the institutes as institutes to be merged in your proposed International Institute, and as there is free access to all the Transactions of all existing institutes I fear your scheme is not likely to take on here.

I am, yours faithfully,

JAMES BARROWMAN.

B.—APPROVE.

1.

THE ENGINEERING SOCIETY.

15 YAMASHINOCCHO, TOKYO, JAPAN,

October 21st, 1894.

Dear Sir,—I am in receipt of your draft of the proposition for the International Institute of Engineers and Architects, and I have now the pleasure of expressing my approval for the same, and also informing you that the proposition has been reported to the members.

I am, yours truly,

B. TANAKI, *Secretary.*

2. CHALMER'S INSTITUTE OF TECHNOLOGY, GOTHENBURG, SWEDEN.

October 3d, 1894.

Dear Sir,— * * * * *

Hearing from friends visiting the Chicago Exhibition that you are interested in founding an International Institute of Engineers and Architects, I will with this offer my services in this country.

* * * * *

Yours sincerely,

B. H. WALLIN, *Civil Engineer.*

NOVEMBER 12th, 1894.

Dear Sir,—Many thanks for your letter of the 3d of November and the printed propositions. The matter was brought up for discussion some days ago at the meeting of the "Tekniska Samfundet" in this city. There were, as usual, 60 or 70 members present. Your proposition was read by the Secretary, but it did not then lead to any decision, because there is just now a proposal before the Society to associate the different societies in our country into one like your International Institute, and until the report of the Committee on this question no action can be taken on your proposition. Your proposition is now spread in this country by "Teknisk Tidskrift" and by "Industrien."

I send with this in separate cover the number of "Industrien" which refers to your proposition.

* * * * *

Yours very truly,

B. H. WALLIN, *Civil Engineer.*

3. EARLE'S SHIP-BUILDING AND ENGINEERING COMPANY, LIMITED.
HULL, ENGLAND.

September 12th, 1894.

Dear Sir,— * * * * *

I am pleased to say that I agree generally with the scheme to establish an Institute of Engineering for the objects named in your circular. I think, however, if you open such a broad doorway as you propose, you would be in the same position as some of the engineering institutions in this country. When an institution admits any one who calls himself an engineer it is no honor to belong to it. You will therefore fail to get within your borders those members most desirable to have. Our own Institution of Civil Engineers has prospered because of its adhering rigidly to an opposite policy; the applicants for admission are exceedingly numerous, but its funds are large, and to be elected a member is an honor as well as an advantage. Ours is the only profession that follows such a loose course of procedure, with the result that there is unlimited competition, and the word "engineer" so used includes all sorts and conditions of men. If you have two or three classes of members, as in the Civil Engineers, you will, I think, found a more successful institution than will be the case if you follow your proposals as detailed in the circular before me.

I am, dear sir, yours faithfully,

A. E. SEATON.

- 4.

THE HAGUE, HOLLAND,

September 12th, 1894.

Dear Sir,—I have received your letter of July 7th, and can in general fully agree with your proposal for establishing an International Institute of Engineers. Some points in my opinion should be more fully developed or elucidated.

I am informed that your proposal has not been received by our Royal Institute of Engineers, Secretary, W. J. Tideman, in this town, which institute is far more extensive than the Society for Civil Engineers at The Hague. I can therefore advise you to send a copy of the papers to this Royal Institute which will certainly take your proposal in earnest consideration and give you more assistance than a single person can do.

Yours sincerely,

P. CALAND.

- 5.

COMMODORE GEORGE W. MELVILLE,

CHIEF OF ENGINEERS, U. S. NAVY.

WASHINGTON, D. C., November 10, 1894.

My dear Mr. Corthell,—Your circular letter relative to the formation of an International Institute of Engineers and Architects has remained unnoticed a much longer time than I intended, it having been laid aside at the time of receipt, and only came to light again a few days ago.

I am in full sympathy with the scheme and shall be pleased to cooperate with you in the undertaking. The only obstacle that I can

see to the success is the fact that there now exist in this and many foreign countries technical societies which cover the ground for each nation, though of course the international feature is missing, and that it might not be an easy matter to get a sufficient number to enter each division to ensure its success. However, that is a matter which can only be determined in the way you have adopted in sending out your circular, and you may count upon me to help.

Yours very truly,

GEORGE W. MELVILLE.

6. Mr. C. O. GLEIM, HAMBURG, GERMANY, ON BEHALF OF THE GERMAN ASSOCIATION OF ENGINEERS AND ARCHITECTS.

May 23d, 1895.

Dear Mr. Corthell,—Your various letters written after your return to America have reached me. I had hoped to reply sooner, but was prevented by repeated absences from town and other causes.

As to your proposal for an International Institute of Engineers and Architects, the idea of bringing the engineers and architects of all countries into closer relations than at present exist has my full sympathy. But I do not think that the organization of an International Institute would be the right way to attain this object, at least for the present. It seems to me that we are not ripe for that yet. There is so little personal acquaintance between engineers of the different countries that I am afraid the printing of papers and written discussions on them, with all the difficulties presented by the difference of languages, would not be sufficient to draw many members together without the aid of a more frequent personal contact between them than quinquennial congresses. I feel sure that under present circumstances there would be very little response from this country. At some future time a permanent institute, somewhat after the manner proposed by you, may be very serviceable. For the present I think it would be much preferable to limit the scope of the movement, and follow up the course so well inaugurated in 1893, by a repetition of international congresses, leaving to future development the question whether these congresses will gradually grow into a more permanent organization.

At the Engineering Congress in Chicago there was one thing in which I felt disappointed, and that was the want of provision for a successor. In the case of other congresses of a similar character, like the Congresses on Navigation and Hygiene, it is a regular business matter for each congress to choose the time and place for the next congress, and to elect the committee for its preparation. This having been omitted during our congress in Chicago, I think the matter ought to be taken up just where the omission was made, by the selection of an International Business Committee and the proposal of time and place for a new congress.

This was what I suggested when your proposition for an International Institute was up before the Convention of Delegates of the Association of German Architects and Civil Engineers' Societies at Strasburg last autumn, and it met with the full concurrence of the convention. If the course suggested is taken up, you may count on the support of this organization, while the idea of a permanent institution does not meet with favor here. In presenting the subject at Strasburg I refrained from mentioning that according to your proposition the management of the institution was to be placed in the hands of an exclusively American board acting as International Executive

Committee, and that the institute was to be domiciled in the United States, or there would have been a storm of opposition, creating at the same time a strong prejudice against any future proposals from your side. I do not think that part of your proposition can be carried in any European country; nor do I see the justice of any one country claiming such predominance over all the others, leaving aside the practical difficulties created by the great distance of the United States from all the other countries.

CONTINUED MAY 25TH, 1895.

If you should take up the idea of proposing a regular system of periodical peregrinating congresses, I have a few personal suggestions to make as follows:

First.—As a rule, the time and place for a congress should not be chosen in connection with some large exposition. For, while it is true that a large exposition will draw together a great many members of the profession, it is equally true that the attractions of the exposition will stand in their way of their interest in the congress. I know of a good number of foreign engineers who were in Chicago at the time of our Engineering Congress, but did not participate because the sights of the White City were already more than they could do justice to, and I feel sure that it will be the same thing if the Engineering Congress be held during the Paris Exposition of 1900. I think the Engineering Congresses ought to be held at intervals of not more than two or three years, so as to keep interest in the proceedings alive. If a strong movement be made now, the next congress might be held in 1897 already.

Second.—The place of the next congress ought not to be in an English-speaking country, so as to provide sufficient alternation for those not versed in that language. So England would be excluded. I would also exclude France and Germany for the present, and wait until there is a better feeling of harmony between these two countries, which I hope will be fostered by the Paris Exposition of 1900. For that occasion I would advocate a social gathering of engineers from all countries, with excursions to objects of professional interest, etc., but think this ought to be outside of the regular series of congresses. For the Congress of 1897, a place in one of the smaller and more neutral countries, like Belgium or Holland, would seem best, to avoid national jealousies. Brussels, Antwerp, Amsterdam, The Hague or Rotterdam would all be very fit places. Otherwise there would be Vienna or Budapest available, or else some Italian city. But the Belgian or Dutch cities would have the advantage of a more central location in Europe, which seems important for the first congress to be held in Europe.

Third.—My advice would be to leave the architects out of the scheme and let them have congresses of their own. The field of the engineering profession is already so broad as to create difficulties by subdivision, which would be enhanced by the addition of architecture. As to the subdivisions, the effect at Chicago was that we had practically seven distinct congresses in session at the same time, making it impossible to attend the meetings of several divisions in which one might have taken interest. How this difficulty may be avoided in future congresses is a question on which I have some suggestions to offer, but leave that to some future occasion. For the present I only wish to express the opinion that the scope should not be widened by including architecture.

Fourth.—The engineering congresses ought to be made self-sup-

porting by fees from the participants and the sale of their printed proceedings, without throwing the expenses on the members of the profession where the congress is held.

This is the gist of what I have to say on the subject. I shall be much interested in learning what action the American societies take at their conventions, and shall be glad if I can be of any service in promoting the matter. Hoping that I shall be able to devote more time to it, and reply more promptly to letters than I have unfortunately been able to do during the past year. Yours most sincerely,

C. O. GLEIM.

7. IMPERIAL RAILWAYS OF NORTH CHINA. ENGINEER-IN-CHIEF'S OFFICE.

TIENTSIN, December 16th, 1894.

Dear Sir,—* * * * *

I beg to thank you for your circular on proposed Institutions of Engineers and Architects, and I consider it a most excellent idea. I, however, think it is a serious error to make the headquarters in America, as the large majority of men eligible for membership will certainly be of European nationalities, and, moreover, will usually be unable to find time or means for crossing the sea simply to attend a few meetings. The rail expense, increased by traveling or living in America, compared with that in Europe, is also prohibitive to men who receive the small salaries prevalent elsewhere. I therefore beg to suggest that the institution purchase a large piece of land on one of the Swiss lakes and there establish their headquarters on neutral territory. The cost of living, and all work connected with publication, will be smaller there than elsewhere, and everything is the best.

Hoping you will give my opinion your consideration while carrying out your valuable scheme, I remain, dear sir,

Yours respectfully,

CLAUDE W. KINDER, F. T. S., M. S. C. E., M. Am. Soc. C. E.

8. INSPECTOR-GENERAL OF ENGINEERS OF THE SPANISH NAVY.

MADRID, February 16th, 1895.

My Dear Sir,—In respect to the proposition which you have kindly sent me in reference to the creation of an International Institute of Engineers and Architects, and considering that it will be a benefit to science in general, and more particularly to the profession to which it has reference, I hope you will have the goodness to tell me whether the establishment of the institute is already assured, and, if so, as I have a desire to become a Fellow, I wish you would indicate in what way I can secure my election. Awaiting your answer, I am,

Yours very truly,

CASIMIRO DE BONA.

9.

CASTELLAMARE DI STABIA,

October 27th, 1894.

Dear Sir,—As soon as I received your notification for the International Institute, I translated it and caused it to be published in the *Rivista Marittima* to give it a wide circulation throughout the country, and now through the courtesy of Signor Luigi Luiggi, Ingenieur en Chef du Genie Civil in Italy, who has favored me with your address, I have the pleasure of forwarding you a copy of the said translation, hoping you may be pleased with it. We hope to succeed well.

Yours very truly, NABOR SOLIANI.

10.

8 RUE DES DEUX PONTS, GAND, BELGIUM.

April 18th, 1895.

Dear Sir,—In the name of the Council of our Association, I beg you to inform us if the project for the creation of an Institute of Engineers and Architects, in which you took the initiative last year, has gone into execution. If so, we also ask you to indicate to us on what basis the institution is established, and on what conditions our Association, or its individual members, can be affiliated.

Yours very sincerely,

In the name of the Council of the Association,

E. HAERENS, *Engineer*.

11.

CANADIAN SOCIETY OF CIVIL ENGINEERS,
112 MANSFIELD STREET,

MONTREAL, November 14th, 1894.

Dear Sir,—Your circular, dated July 7th last, regarding a proposition for the organization of an International Institute of Engineers, came before the Council of this Society at its Annual Meeting held last evening, and was recommended to the favorable consideration of the members of the Council, and will be brought to the attention of the Society at its next meeting.

Yours truly,

C. H. McLEOD, *Secretary*.

12.

AMERICAN INSTITUTE OF ARCHITECTS,
PROVIDENCE, R. I., June 6th, 1895.

Dear Sir,—Your circular letter of July 7th, with prospectus of proposed International Institute of Engineers and Architects, came duly to hand, was considered at a meeting of the Board of Directors of the American Institute of Architects, held at Chicago, on the 3d inst., and by vote of the Board the Secretary was directed to express to you its approval of the plan presented. If the Board or its Secretary can further aid you in promoting the purposes of the proposed Institute, the matter will be duly considered and such aid rendered as may be in power.

With assurances of consideration and esteem, I am,

Yours truly,

ALFRED STONE, *Secretary*.

13.

ROYAL INSTITUTE OF ENGINEERS,
THE HAGUE, HOLLAND, November 7th, 1894.

Dear Sir,—We have the honor to acknowledge the receipt of your circular letter of July 7th, 1894, with accompanying draft of a proposition for an International Institute of Engineers and Architects.

With great interest we have taken cognizance of this very comprehensive purpose, and we desire to be informed in due time in respect to the results which the proposition may have had.

The Council of the Institute,

L. OMANS, *President*.TIDEMAN, *Secretary*.

14. SEÑOR DON M. FERNANDEZ LEAL, PRESIDENT OF THE ASSOCIATION
OF ENGINEERS AND ARCHITECTS OF MEXICO, AND MINISTER
OF PUBLIC WORKS.

May 1st, 1895.

My Dear Sir,—I have the honor to refer to your note relating to the proposition made to this Society for the establishment of an Interna-

tional Institute of Engineers and Architects, and I have the satisfaction of informing you that the Society has given careful consideration to your initiation and the attention which its importance requires, appointing for the purpose a committee to study it and to determine in regard to it. It was then discussed in connection with the report of the Committee, which report has been approved without any modification. The pamphlets which I have the pleasure of sending you, together with this letter, contain your initiation translated into Spanish, and also the report of the committee which has considered it. It also contains the propositions of the same committee, approved in extraordinary session, according to the rules and regulations of this Association. The observations and modifications which have been made in reference to your project are of detail merely, and I hope that, taking them into consideration, they will be fully approved by you.

While having the pleasure of informing you in reference to the results of so important a business, it is a satisfaction to inform you that this Association views with positive interest your initiation on account of its lofty aims and the certain tendency to establish indis-soluble ties between the engineers of all countries.

I am, with high appreciation and consideration,

Yours very sincerely,

M. FERNANDEZ LEAL, *President of the Association.*

REPORT OF THE COMMITTEE OF THE MEXICAN ASSOCIATION TO THE
PRESIDENT OF THE ASSOCIATION OF ENGINEERS AND ARCHITECTS.

"In compliance with the duty which you intrusted to us in the session of the first of the present moment of giving our opinion in reference to the proposition presented by the United States Engineer, Mr. Elmer L. Corthell, relative to the formation of an International Institute of Engineers and Architects, we have the honor of presenting to you this report as result of our studies.

"The idea of Mr. Corthell is among those whose enunciation simply is sufficient to predispose anyone in its favor by the elevation of its aims and by the laudable purposes which it contains. Our associations already have knowledge of the principal points of the proposition by the reading of it, which took place in the meeting of the Association, and they have been able to see that the object of the proposed Institute is to unite in close relations the engineers of all countries, and to establish among them an exchange of ideas and information, which cannot but produce the best results, not only in regard to purely speculative matters, but in the field of practice.

"With such antecedents, the Commission gave itself at once with pleasure to the project of Mr. Corthell, and desires sincerely that it may meet with realization, regardless of the difficulties which, without doubt, it will have to meet before it reaches all of the results which are hoped for by him.

"In the present age observation has shown that the greatest conquests of knowledge are much more fruitful of useful results by individual initiative than through corporations, which seem to lose ground on account of their slower methods of procedure; neither are they always able to respond opportunely to the exigencies and necessities of modern ideas, which develop so rapidly. It is, therefore, to be desired that the institute, having in view these conditions, may be

fully able to utilize and give easy and ample development to the results of individual initiative, which has above everything else the powerful stimulant of competition, so as to produce by its own works as a result of studies made collectively. The organization proposed by Mr. Corthell satisfies in part this idea where it refers to the printing and circulation extensively of the works of the Fellows of the institute, but the same results may not occur in respect to experiments of the resistances of the materials which the institute proposes to make, and this leads the Commission to think that perhaps this part of the project may not meet with the desirable result."

(NOTE.—The Committee then refers to the delays that may be occasioned by the method proposed for collecting, printing and distributing the papers and discussions thereon.)

"Not finding in the classification of the works with which the institute is to occupy itself those relative to geodesy and astronomy, we propose that to the divisions into which the project is divided there should be added one with the following title: 'Geodesy and Astronomy.'

"As Mr. Corthell requests the views of our Association in reference to where should be the central office, we take pleasure in proposing Boston, whose history and general renown as a city of wisdom makes it *par excellence* a suitable place for a body devoted absolutely to scientific studies.

"Recapitulating what we have said, we have the honor of submitting to the deliberations of this Society the following propositions:

"*First.*—Reply to Mr. Corthell that this Association approves fully his ideas relative to the formation of the International Institute of Engineers and Architects, permitting itself, however, to call attention to the delay which may result in the revision of the papers of the Fellows, and that for this reason it would seem to be convenient that the final approval of papers should devolve upon the respective National Councils, after which the papers could go at once for publication under the direction of the International Executive Committee.

"*Second.*—Propose that to the divisions of the institute there should be added one with the following title: 'Division J—Geodesy and Astronomy.'

"*Third.*—Also, say that in the view of this Association the city of Boston comprises the best conditions for the domicile of the central office of the institute."

MEXICO, August 20th, 1894.—Agustín Aragón, José Covarrubias, Rafael R. Arizpe.

15.

FRENCH SOCIETY CIVIL ENGINEERS,

LE CITE ROUGEOMONT, PARIS, FRANCE,

January 18th, 1895.

Sir and Honored Colleague,—We received last year the letter that you so kindly sent us relative to the formation of an International Institute of Engineers and Architects.

Each of the members of our Council has carefully studied these documents and given his opinion.

After agreement and discussion of the ideas thus gathered together I am asked to transmit to you the following resolution:

"The Council of the French Society of Civil Engineers, after a

careful examination of Mr. Corthell's project concerning the formation of an International Institute of Engineers and Architects, is of the opinion that this proposition can only be studied advantageously in a plenary assembly of the societies interested."

The Council thinks that the favorable time for taking up this question of the engineers and architects of the whole world will be at the Exposition of 1900, during which international congresses will be held.

Accept, my dear colleague, the assurance of my best regards.

LÉON APPERT, *President*.

16.

LEGHORN, ITALY,

May 20th, 1895.

My Dear Mr. Corthell,—In answer to your kind favor of the 22d of April, I beg to inform you that after having consulted the leading engineers of the Royal Corps of Civil Engineers, after having conferred with Col. Soliani for his opinion and that of the leading engineers and that of the Royal Corps of Naval Engineers, and also having consulted several engineers belonging to private firms, I have collected all their opinions about the International Institute of Engineers. The result is—and I speak also in the name of Col. Soliani—that we in Italy believe that a federation of the existing engineering societies would be most desirable and most feasible, and is the only one that, so far as Italy is concerned, would be sure of success with us. It would give the same results, leave each society free and at the same time connect all engineers in a whole federation. As to the aristocracy of societies, which is more or less strict in the admission of their members, we waive it; all engineers are for us colleagues and equal.

With kindest regards, I remain

Sincerely yours,

L. LUIGGI, *Engineer-in-Chief of Civil Engineers*.

EXCURSIONS, ETC., DURING THE TWENTY-SEVENTH ANNUAL CONVENTION.

WEDNESDAY, JUNE 19TH, 1895.—This afternoon was devoted to an excursion through the Boston Parks, tendered to the Society and its guests by the local Members. Embarking at the Pemberton wharf at 12.50 o'clock the party proceeded by steamer to Rowe's Wharf, Boston, there entering carriages, and was driven up State and Beacon Streets past the State House, Common and Public Garden to Commonwealth Avenue, through the Fens, Riverway, Leverett and Jamaica Parks to the Arnold Arboretum, thence passing through Brookline to Chestnut Hill Pumping Station and Reservoir, which was reached at 16.15, and, after partaking of a light collation, returned to Rowe's Wharf *via* the Beacon Street Boulevard, and by steamer, arriving at the Hotel Pemberton at 19 o'clock.

THURSDAY, JUNE 20TH, 1895 (Afternoon).—A special train, provided through the courtesy of the New York, New Haven and Hartford Railroad Company, left the Hotel Pemberton at 13 o'clock and arrived at

Plymouth at about 14.30 o'clock. Through the courtesy of C. E. Barnes, Esq., Superintendent, and the Plymouth and Kingston Electric Railway Company, special electric cars were placed at the disposal of the party for a general view of the town, and for visits to Plymouth Rock, the Monument, Pilgrim Hall, etc. The party returned by special train to the Hotel Pemberton, arriving about 18 o'clock. Details of this excursion were in charge of the Boston Society of Civil Engineers.

FRIDAY, JUNE 21ST, 1895 (Morning).—By invitation of Hon. Edwin U. Curtis, Mayor of Boston, and the Metropolitan Sewerage Commissioners, the party embarked in the steamers *J. Putnam Bradlee* and *Cormorant* (the latter kindly furnished through Bertrand T. Wheeler, Esq., Superintendent Street Department, Boston), leaving Pemberton Wharf at 8.45 o'clock, proceeded to the Boston Main Drainage Pumping Station at Old Harbor Point, thence to the Moon Island Reservoir, where the method of emptying the sewage and of cleaning reservoirs was inspected, and thence to the (North) Metropolitan Sewerage Pumping Station on Deer Island, where the large centrifugal pumps were seen in operation. The Hotel Pemberton was reached on the return trip at 13 o'clock.

Afternoon.—Through the courtesy of Major W. R. Livermore, United States Army, and Commanders F. M. Green and H. G. Colby, United States Navy, a number of members and guests were taken on a lighthouse steamer to Minot's Ledge Light, which they were given an opportunity of inspecting.

SATURDAY, JUNE 22D, 1895.—After the final adjournment of the Convention, 350 Members and guests participated in an excursion to the White Mountains as follows: From the Hotel Pemberton to Boston by steamer to Rowe's Wharf, Boston; thence by special street cars, kindly provided by the West End Street Railway Company, to the Union Station, Boston and Maine Railroad; thence by special train, provided by the kindness of the Boston and Maine Railroad Company, through Lucius Tuttle, President, and T. A. MacKinnon, General Manager, to the Crawford House. The train was scheduled to arrive at the Crawford House before dark, but owing to the blowing out of a cylinder head, did not arrive until about 21 o'clock. The party was so large that the Crawford House was more than filled and a large number were accommodated at Fabian's.

SUNDAY, JUNE 23D, 1895.—Excursions to the top of Mt. Washington were made, both in the morning and in the afternoon, and about 180 made the ascent. The ascent of Mt. Willard was also made by a large number. Special trains between the Crawford House and Fabian's, without which the program could not have been carried out, were kindly furnished by the Maine Central Railroad Company through William A. Allen, M. Am. Soc. C. E., Chief Engineer. The return from the Crawford House to Boston was made by special train on Monday, June 24th, leaving at 9 o'clock.

THE ATTENDANCE AT THE 27TH ANNUAL CONVENTION.

The following 267 members were in attendance at the Convention:

- | | |
|--|--|
| Frederic V. Abbot...Charleston, S. C. | Edward B. Codwise...Kingston, N. Y. |
| C. Frank Allen.....Boston, Mass. | Amory Coffin.....Phoenixville, Pa. |
| Henry C. Allen.....Syracuse, N. Y. | Freeman C. Coffin.....Boston, Mass. |
| Kenneth Allen.....Yonkers, N. Y. | Mendes Cohen.....Baltimore, Md. |
| William Albert Allen..Portland, Me. | Elmer L. Corthell....New York City. |
| Frederic J. Amweg..Philadelphia, Pa. | William Price Craighill, |
| | Washington, D. C. |
| John W. Bacon.....Danbury, Conn. | R. Walter Creuzbaur..New York City. |
| William H. Baker...Fitchburg, Mass. | J. James R. Croes....New York City. |
| Thomas W. Baldwin....Bangor, Me. | Wilson Crosby... ..Bangor, Me. |
| Wm. Henry Baldwin..Yonkers, N. Y. | Foster Crowell.....New York City. |
| Charles B. Ball...Washington, D. C. | Charles Gilman Currier, |
| David Leonard Barnes...Chicago, Ill. | New York City. |
| H. Bissell.....Boston, Mass. | |
| George H. Blakeley...Paterson, N. J. | Charles G. Darrach...Philadelphia, Pa. |
| John Bogart.....New York City. | Arthur L. Davis.....St. Albans, Vt. |
| Channing M. Bolton.....Rio, Va. | Charles Davis.....Pittsburgh, Pa. |
| Adolphus Bonzano..Philadelphia, Pa. | Joseph P. Davis.....New York City. |
| John B. Bott.....Baltimore, Md. | E. P. Dawley.....Providence, R. I. |
| William A. Brackenridge, | J. H. Dingle.....Charleston, S. C. |
| Niagara Falls, N. Y. | Richard D. Dodge...Brooklyn, N. Y. |
| Dexter Brackett.....Boston, Mass. | Albert B. Drake..New Bedford, Mass. |
| William H. Bradley...Boston, Mass. | John B. Dunklee..Washington, D. C. |
| Alex. H. Brinckerhoff New York City. | H. F. Dunham.....New York City. |
| H. Waller Brinckerhoff, | |
| New York City. | Horace L. Eaton..Somerville, Mass. |
| Calvin E. Brodhead..Edgewater, N. J. | Norman W. Eayrs....St. Louis, Mo. |
| Fred. Brooks.....Boston, Mass. | Charles E. Emery....New York City. |
| James S. Browne...Providence, R. I. | Oscar Erlandsen...Woonsocket, R. I. |
| L. L. Buck.....New York City. | George E. Evans.....Boston, Mass. |
| Waldo E. Buck...Woburn, Mass. | |
| William D. Bullock..Providence, R. I. | John T. Fanning..Minneapolis, Minn. |
| Clifford Buxton.....Toledo, Ohio. | Mark Fargusson....Southport, N. C. |
| | Frederic H. Fay...Marlboro', Mass. |
| D. D. Carothers....Cincinnati, Ohio. | B. R. Felton.....Boston, Mass. |
| David S. Carll....Washington, D. C. | Charles A. Ferry..New Haven, Conn. |
| Robert Cartwright..Rochester, N. Y. | Desmond FitzGerald, |
| Loomis E. Chapin....Canton, Ohio. | Brookline, Mass. |
| John C. Chase....Wilmington, N. C. | J. Leland FitzGerald, |
| Albert S. Cheever...Fitchburg, Mass. | Schenectady, N. Y. |
| John E. Cheney...Boston, Mass. | Robert Fletcher.....Hanover, N. H. |
| S. H. Chittenden...East River, Conn. | Charles Francis....Davenport, Iowa. |
| George L. Christian...Yonkers, N. Y. | George B. Francis..Providence, R. I. |
| Ludlow V. Clark, Jr. Philadelphia, Pa. | Harry Frazier.....Richmond, Va. |
| Thomas C. Clarke...New York City. | John R. Freeman.....Boston, Mass. |

- Alexis H. French....Brookline, Mass.
 Felix Freyhold....Washington, D. C.
 Joseph P. Frizell.....Boston, Mass.
 George H. Frost.....New York City.
 Alphonse Fteley....New York City.
 Frank L. Fuller.....Boston, Mass.
 William B. Fuller....Boston, Mass.
- Walter H. Gahagan...Kansas City, Mo.
 Emil Gerber.....Chicago, Ill.
 George E. Gifford....New York City.
 John M. Goodell....Brooklyn, N. Y.
 Wilbur F. Goodrich,
 Somerville, Mass.
 Justus Herbert Grant,
 Rochester, N. Y.
 Samuel M. Gray....Providence, R. I.
 Bernard R. Green,
 Washington, D. C.
 Edward A. Greene..Providence, R. I.
 Joseph N. Greene.....Calais, Me.
 John E. Greiner.....Baltimore, Md.
 B. W. Guppy.....Melrose, Mass.
 Edward B. Guthrie....Buffalo, N. Y.
- Richard A. Hale....Lawrence, Mass.
 Charles Hansel.....Easton, Pa.
 George R. Hardy....Stamford, Conn.
 Charles M. Harris....New York City.
 Robert L. Harris....New York City.
 Van Alen Harris.....Yonkers, N. Y.
 Benjamin M. Harrod,
 New Orleans, La.
 James Dudley Hawks..Detroit, Mich.
 John V. Hazen.....Hanover, N. H.
 Rudolph Hering....New York City.
 Clemens Herschel...New York City.
 Edwin A. Hill....New Haven, Conn.
 William R. Hill.....Syracuse, N. Y.
 Frank W. Hodgdon....Boston, Mass.
 Gilbert Hodges.....Medford, Mass.
 Theod. G. Hoech..Washington, D. C.
 John J. Hopper.....New York City.
 Horace E. Horton....Chicago, Ill.
 Edward W. Howe.....Boston, Mass.
 Milton G. Howe....Houston, Texas.
 John T. N. Hoyt....New York City.
 William E. Hoyt....Rochester, N. Y.
 Charles Warren Hunt..New York City.
- Conway B. Hunt..Washington, D. C.
 C. M. Ingersoll, Jr.,
 Jamaica Plain, Mass.
 J. M. Jackson.....Chicago, Ill.
 William Jackson.....Boston, Mass.
 Edward C. Jordan....Portland, Me.
 William J. Karner....New York City.
 Alex. Edward Kastl....Chicago, Ill.
 Herbert C. Keith..New Haven, Conn.
 Howard G. Kelley..Texarkana, Texas.
 George A. Kimball....Boston, Mass.
 Charles C. King,
 West New Brighton, N. Y.
 Joseph M. Knap....New York City.
 Louis H. Knapp.....Buffalo, N. Y.
 Morris Knowles.....Boston, Mass.
 Emil Kuichling.....Rochester, N. Y.
 F. C. Kunz.....Philadelphia, Pa.
- H. A. LaChicotte....New York City.
 Olin H. Landreth..Schenectady, N. Y.
 Perry Lawton.....Providence, R. I.
 George H. Leland..Providence, R. I.
 Henry R. Leonard..Philadelphia, Pa.
 R. W. Lesley.....Philadelphia, Pa.
 G. Leverich.....Brooklyn, N. Y.
 M. Lewinson.....New York City.
 H. J. Lindsay.....Pittsburgh, Pa.
 Thomas D. Lovett..Cincinnati, Ohio.
 Julius Alfred Ludwig,
 Washington, D. C.
- William W. Maclay,
 Cambridge, Mass.
 Henry Manley.....Boston, Mass.
 Walter R. Marden....Pittsburgh, Pa.
 George C. Mason....New York City.
 Henry L. Marindin,
 Washington, D. C.
 William M. Marple....Scranton, Pa.
 Charles C. Martin....Brooklyn, N. Y.
 Joseph Mayer.....New York City.
 Thomas H. McCann..Hoboken, N. J.
 William E. McClintock..Boston, Mass.
 Thomas C. McCollom,
 Brooklyn, N. Y.
 David E. McComb, Washington, D. C.

- Walter McCulloh,
Niagara Falls, N. Y.
- James C. McGuire...Ellicott City, Md.
- Theodore H. McKenzie,
Southington, Conn.
- Alexander Rice McKim,
New York City.
- John J. McVean,
Grand Rapids, Mich.
- Elwood Mead.....Cheyenne, Wyo.
- David N. Melvin,
Linoleumville, N. Y.
- Henry C. Meyer.....New York City.
- Spencer Miller.....New York City.
- Arthur L. Mills.....Toledo, Ohio.
- Samuel L. Minot.....Boston, Mass.
- James D. Moffet.....Radford, Va.
- R. Montfort.....Louisville, Ky.
- L. G. Montony.....New York City.
- W. Harley Moore..New Haven, Conn.
- Aug. Mordecai.....Cleveland, Ohio.
- George S. Morison.....Chicago, Ill.
- George S. Morrill.....Boston, Mass.
- Charles J. Morse.....Chicago, Ill.
- John C. Moses.....Cambridge, Mass.
- A. T. Mosman.....Washington, D. C.
- Mace Moulton.....Springfield, Mass.
- R. E. Neumeyer.....Bethlehem, Pa.
- Edward P. North.....New York City.
- Albert F. Noyes.....Boston, Mass.
- F. S. Odell.....Mt. Vernon, N. Y.
- Eben Erskine Olcott..New York City.
- Frank C. Osborn.....Cleveland, Ohio.
- Joseph O. Osgood.....New York City.
- Stacy B. Opdyke, Jr. Philadelphia, Pa.
- George H. Pegram.....Omaha, Neb.
- Arsène Perrilliat....New Orleans, La.
- P. S. Perkins.....Providence, R. I.
- P. Alex. Peterson..Montreal, Canada.
- Henry A. Phillips.....Boston, Mass.
- Howard Crathorne Phillips,
Jamaica Plain, Mass.
- Albert H. Porter..Niagara Falls, N. Y.
- Alex. Potter.....New York City.
- Edward Prince.....Quincy, Ill.
- Henry G. Prout.....New York City.
- George A. Quinlan..Houston, Texas.
- Robert L. Read....Cincinnati, Ohio.
- Benjamin Reece.....Chicago, Ill.
- J. V. W. Reynders.....Steelton, Pa.
- Lewis Frederick Rice..Boston, Mass.
- Joseph R. Richards....Boston, Mass.
- Henry B. Richardson,
New Orleans, La.
- Thomas F. Richardson..Boston, Mass.
- Percival Roberts, Jr. Philadelphia, Pa.
- Thomas Rodd.....Pittsburgh, Pa.
- Elmer W. Ross....Providence, R. I.
- William Rotch.....Boston, Mass.
- Leonard W. Rundlett..St. Paul, Minn.
- Francis W. Scarborough,
Cincinnati, Ohio.
- Max E. Schmidt....Princeton, N. J.
- Charles C. Schneider...Pencoyd, Pa.
- Addison M. Scott..Charleston, W. Va.
- Henry B. Seaman..Mt. Vernon, N. Y.
- J. Herbert Shedd..Providence, R. I.
- J. Waldo Smith.....Montclair, N. J.
- Merritt H. Smith.....Yonkers, N. Y.
- Oberlin Smith.....Bridgeton, N. J.
- T. Guilford Smith....Buffalo, N. Y.
- Charles H. Snow.....New York City.
- J. Parker Snow.....Boston, Mass.
- Otto Sonne.....Boston, Mass.
- E. Gybbon Spilsbury..Trenton, N. J.
- James H. Stanwood....Boston, Mass.
- Frederic P. Stearns...Boston, Mass.
- Waterman Stone...Providence, R. I.
- Edmund Coffin Stout,
Scarborough-on-Hudson, N. Y.
- A. A. Stuart.....Brooklyn, N. Y.
- George Fillmore Swain..Boston, Mass.
- Charles H. Swan.....Boston, Mass.
- Roger Tappan.....Boston, Mass.
- Lucian A. Taylor.....Boston, Mass.
- Wm. H. G. Temple..Providence, R. I.
- Samuel C. Thompson..New York City.
- John Thomson.....New York City.
- Marshall M. Tidd....Boston, Mass.
- S. E. Tinkham.....Boston, Mass.
- Calvin Tomkins.....New York City.
- George M. Thompson..Wakefield, Mass.

E. E. Russell Tratman,	George H. White...	Worcester, Mass.
New York City.	Frank O. Whitney ...	Boston, Mass.
L. L. Tribus.....	Don J. Whittemore...	Milwaukee, Wis.
New York City.	Charles A. Wilson.....	Toledo, O.
Wolfgang G. Triest..	Henry W. Wilson..	Philadelphia, Pa.
New York City.	Herbert M. Wilson..	Washington, D.C.
Alfred W. Trotter...	Joseph M. Wilson..	Philadelphia, Pa.
Boston, Mass.	Frederick K. Wing....	Buffalo, N. Y.
E. K. Turner.....	H. B. Wood.....	Boston, Mass.
G. R. Tuska.....	Henry D. Woods..	West Newton, Mass.
New York City.	Charles J. H. Woodbury,	
G. H. Vedeler.....	Boston, Mass.	
New York City.	J. R. Worcester.....	Boston, Mass.
William Watson.....	William E. Worthen..	New York City.
Boston, Mass.		
Walter Loring Webb,		
Philadelphia, Pa.		
Henry D. Whitcomb..		
Richmond, Va.		

The total attendance at the Convention was as follows :

Members of the Society (in all grades).....	267
Guests—Gentlemen.....	109
Ladies of the families of Members....	193
“ not of the families of Members.	43
Total guests.....	345
Total.....	612

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.	Date of Membership.
AUS, GUNVALD.....Office of Supervising Architect, U. S. Treasury, Washington, D.C.	April 3, 1895
COLBY, BRANCH HARRIS.....City Hall, St. Louis, Mo.....	June 5, 1895
HUNTER, WILLIAM.....Reading Terminal, Philadelphia, Pa.....	June 5, 1895
INGERSOLL, COLIN MACRAE, Jr.....Jamaica Plain, Mass...	June 5, 1895
LEDoux, JOHN WALTER.....1319 Filbert St., Philadelphia, Pa.....	June 5, 1895
MOORE, WILLIAM HARLEY.....New Haven, Conn.....	June 4, 1895
SHALER, IRA ALEXANDER.....40 Wall St., New York City.....	July 4, 1888
WOODS, HENRY DICKINSON.....City Engineer, West Newton, Mass.....	June 5, 1895
Assoc. M.	March 1, 1893
M.	June 5, 1895

ASSOCIATE MEMBERS.

BEERETON, THOMAS JOHN.....	Engineer Cumberland Valley R.R., Chambers- burg, Pa...	J. Assoc. M.	Oct. June	7, 1885 5, 1895
GILLIS, HARRY ALEXANDER.....	Master Mechanic, Roa- noke Shops, N. & W. R. R., Roanoke, Va...		June	5, 1895
GREENE, HOWARD ARNOLD.....	Box 635, Trenton, N. J.		June	5, 1895
LUCAS, EUGENE WILLETT VAN COURT..	Lieut., Corps of Engi- neers, U. S. A., Wil- mington, N. C.		April	3, 1895
PARDEE, JAMES THOMAS.....	196 Dodge St., Cleve- land, Ohio.....		June	5, 1895
PERKINS, PHILO SACKETT.....	Assistant Engineer N. Y., N. H. & H. R R., Provi- dence, R.I.	J. Assoc. M.	Mar. April	5, 1890 3, 1895
SNOW, FRANK HERBERT.....	City Engineer, Brock- ton, Mass.....		June	4, 1895
TUCKER, WILLIAM CONQUEST.....	Englewood, { N. J..... {	J. Assoc. M.	May Dec.	5, 1891 5, 1894

JUNIORS.

DINGLE, JAMES HERVEY.....	City Hall, Charleston, S. C.....		April 30,	1895
DOUGLAS, FREDERIC ARNOLD.....	121 N. Terrace Ave., Mt. Vernon, N. Y....		April 30,	1895
SYKES, GEORGE WHITFIELD.....	Mercer, Pa.....		April 30,	1895
TABER, GEORGE AYMAR.....	Montrose, Mass.....		April 30,	1895
TRAVELL, WARREN BERTRAM.....	116 East 17th St., New York City.....		April 30,	1895
VANDERLIP, HENRY ELEAZER.....	222 N. Illinois St., In- dianapolis, Ind.....		April 30,	1895
WILLIAMS, SAMUEL WALTER.....	Elmira Bridge Co., El- mira, N. Y.....		Oct.	2, 1894

CHANGES AND CORRECTIONS.

MEMBERS.

BALLARD, ROBERT.....	Menzies, (care Alex. Mathieson & Co.), Coolgardie, West Australia.
BLAND, JOHN C.....	(Care Chief Engineer P., C., C. & St. L. Ry.), Pittsburg, Pa.

BRINCKERHOFF, ALEX. G.	Supt. of Works, Johnson and Morris, 309 West Broadway, New York City.
BRUNER, D. P.	417 West Chelben Ave., Germantown, Philadelphia, Pa.
CURTIS, W. W.	1108 Marquette Bldg., Chicago, Ill.
FRANCIS, HENRY N.	Gen. Man. Narragansett Imp. Co., 17 Custom House, Providence, R. I.
GREENE, E. A.	Rawlins, Wyo.
HAINES, C. W.	Engineer and Manager Am. Concrete Cons. Co., 26 South 15th St., Phila- delphia, Pa.
HAINS, P. C.	Lt.-Col., Corps of Engineers, U. S. A., 9 Pleasant St., Baltimore, Md.
KAREISCHA, S.	Perwaja Meshanskaja House, Bogdanow, Moscow, Russia.
MACKENZIE, ALEXANDER	Lt.-Col. Corps of Engineers, U. S. A., Office of Chief of Engineers, U. S. A., Washington, D. C.
METCALF, WILLIAM	709 Ferguson Block, Pittsburgh, Pa.
PAINE, ARTHUR B.	Pierpont House, Brooklyn, N. Y.
POTTER, H. W.	(Care J. Aparicio e hijos), Quezaltenango, Guatemala, C. A.
RIFFLE, A. S.	(Care Water Commissioners), Astoria, Ore.
SEARS, ALFRED F.	393 Clermont Ave., Brooklyn, N. Y.
TAYLOR, JAMES T.	433 Stimson Block, Los Angeles, Cal.
WENTWORTH, C. C.	923 Market St., Wilmington, Del.
WHITFORD, O. F.	94 East Utica St., Buffalo, N. Y.

ASSOCIATE MEMBERS.

HUDSON, C. W.	Berlin Iron Bridge Co., East Berlin, Conn.
MATTHEWSON, I.	Grafton, Ill.
MORLEY, FRED	Lapeer, Mich.
OAKLEY, FRANK T.	City Engineer's office, Toledo, Ohio.
PENNYPACKER, L. P.	Chief Engineer El Salto R. R., Escuintla, Guatemala, C. A.
TREADWELL, LEE	207 Elm St., Sioux City, Iowa.
VAN ORNUM, JOHN L.	435 South Lake Ave., Pasadena, Cal.
WATSON, WALTER	Salem, Va.

ASSOCIATE.

HUNSIKER, MILLARD	435 Penn Ave., Pittsburgh, Pa.
-------------------	--------------------------------

JUNIORS.

BORIGHT, WILLIAM P.	Box 593, West Newton, Mass.
MILLARD, CURTIS	302 Light St., Baltimore, Md.

RIDGWAY, ROBERT	Assistant Engineer Aqueduct Commission, Kingsbridge, New York City.
TUSKA, G. R.	62 William St., Room 45, New York City.
WALLACE, W. M.	Bureau of Construction and Repair, Navy Dep't, Washington, D. C.
YEATMAN, H. C.	Assistant Engineer Mexican International R. R., Chalchihuitis, Zacatecas, Mexico.

ADDITIONS TO

LIBRARY AND MUSEUM.

From American Institute of Mining Engineers:

- Transactions. Volume XXIV, 1894.
- Assays of Copper and Copper Matte.
- A New Slag Car for Lead and Copper Blast Furnaces.
- Biographical Notice of Moritz Ferdinand Gaetzschmann.
- Discussion of Paper on a Water-Cooling Apparatus.
- Discussion of Paper on Nickel and Nickel Steel.
- Geological Sketch of Florida.
- Hysteromorphous Auriferous Deposits of the Tertiary and Cretaceous Periods in New Zealand.
- Milling Arizona Gold Ores with a "Colorado" Stamp Mill.
- Mining Leases.
- Notes on a Southern Coal-Washing Plant.
- Proceedings of the Twenty-fifth Annual Meeting.
- The Assay of Silver Sulphides.
- The Albion Phosphate District.
- The Florida Rock-Phosphate Deposits.
- The Ducktown Ore Deposits.
- The Cyanide Process as Applied to the Concentrates from a Nova Scotia Gold Ore.
- The Northeastern Bituminous Coal Measures of the Appalachian System.
- The Present Limitations of the Cyanide Process.
- The Lixiviation of Silver Ores by the Russell Process, at Aspen, Colo.
- Treatment of Roasted Gold Ores by Means of Bromine.

From M. T. Argollo, Bahia, Brazil:

- Map of the State of Bahia.
- Refutation of the Report of the Chief Engineer of the D. Pedro 2d R. R. respecting the reduction of the gauge of its extension.
- Descriptive Memorial of the Bahia and Minas R. R.

Statutes of the Traffic and Construction of the Bahia and San Francisco Extension R. R.

- Regulations and Tariffs of the Bahia and San Francisco Extension R. R.
- Code of Rules for the Accounting Department of the Bahia and San Francisco Extension R. R.
- Code of Rules for the Employees of the Bahia and San Francisco Extension R. R.

From Boston Public Library, Boston, Mass.: Forty-third Annual Report, 1894.

From F. E. Brandis, Sons & Co., Brooklyn, N. Y.:

- Hand-Book of Instruments of Precision for Civil Engineers, Surveyors and Astronomers.

From Canadian Society of Civil Engineers, Montreal, Can.:

- List of Members and Report of Annual Meeting, 1895.

From Club de Engenharia, Rio de Janeiro, Brazil:

- Revista Mensal, No. 1, 1895.

From Cornell University, Ithaca, N. Y.:

- Bulletins Nos. 93 and 94 of the Agricultural Experiment Station.

From Engineering Societies of the University of Illinois, Champaign, Ill.:

- The Technograph, No. 9, 1894-95.

From Desmond FitzGerald, Brookline, Mass.:

- A Short Description of the Boston Water Works.

From Herman Haupt, Washington, D. C.:

- Long-Distance Transmission of Power.

From E. W. Howe, Boston, Mass.:

- Twentieth Annual Report of the Board of Commissioners, Department of Parks, Boston, Mass., for the year ending January 31st, 1895.

From Institute of Marine Engineers, London, Eng.:

- Transactions, Vol. IV.

- From Institution of Civil Engineers, London, Eng.:
List of Members, June 3d, 1895.
- From David N. Melvin, Lincolntonville, N. Y.:
Samples of Paints and Allied Products.
- From George S. Morison, Chicago, Ill.:
Report on the Bellefontaine Bridge.
- From William Murdoch, St. John, N. B.:
Engineer and Superintendent's Report on Sewerage and Water Supply of St. John, N. B., for 1894.
- From N. Y. Meteorological Observatory, N. Y.:
Reports for January, February and March, 1895.
- From Wm. Barclay Parsons, New York:
Plans of Board of Rapid Transit Railroad Commissioners of the City of New York, adopted May 9th, 1895.
- From Collingwood Schreiber, Ottawa, Can.:
Annual Report of the Department of Railways and Canals for the fiscal year from 1st July, 1893, to 30th June, 1894.
- From Society of Naval Architects and Marine Engineers, Washington, D. C.:
Transactions, Vol. II, 1894.
- From F. J. E. Spring, Shilling, Assam, India:
Kistna Bridge, Practical Notes.
- From Louis L. Tribus, N. Y.:
Report of the Health Committee of the Good Government Club on the Water Supply of New Brighton and Port Richmond.
- From U. S. Department of Agriculture:
Report on the Use of Metal for Railroad Ties.
- From U. S. Department of Agriculture, Weather Bureau:
Report on the Condensation of Atmospheric Moisture.
- From U. S. Department of the Interior:
Report on Statistics of Churches in the United States at the Eleventh Census.
- From U. S. Department of State:
Consular Report for June, 1895.
- From U. S. Treasury Department, U. S. Coast and Geodetic Survey:
Bulletin No. 34, Distribution of the Magnetic Declination in Alaska for the year 1895.
- From U. S. War Department, Chief of Engineers:
Two Reports on the Improvement of Rivers. Thirty-six Specifications for the Improvement of Certain Rivers and Harbors.
- From University of Wisconsin, Madison, Wis:
An Experimental Study of Field Methods, which will insure to Stadia Measurements Greatly Increased Accuracy.
- From Lionel B. Wells, Manchester, Eng.
Canals.
- From Geo. S. Webster, Philadelphia, Pa.
Annual Report of the Bureau of Surveys of Philadelphia for the year ending December 31st, 1894.
- By Exchange:
Final Report of the Board of Sewer Commissioners of the Town of Brockville, Ont., 1887-1891.
Biological Examination of Mohawk River at Schenectady, N. Y.
Report on an Additional Water Supply for the City of Troy.
Alessandro Irrigation District, California. Its Physical, Engineering and Business Problems and Conditions.
Perris Irrigation District, California. Its Physical, Engineering and Business Problems and Conditions.
Grapeland Irrigation District, Cal. Its Physical and Engineering Problems and Business Status.
Central Irrigation District, Cal. Its Physical, Engineering and Business Problems and Conditions.
A Discussion of the Drainage and Water Supply of Chicago.
Engineers' Report and Surveys of the City of Plainfield, N. Y., for the Introduction of Water-Works and Sewage Disposal.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—July, 1895.

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LIST OF MEMBERS.

ADDITIONS.

MEMBERS.

		Date of Membership.
CAPPELEN, FREDERICK WILLIAM....	City Engineer, Minneapolis, Minn.....	April 3, 1895
HISLOP, JOHN.....	Eagle, Colo.....	May 1, 1895
KELLOGG, NORMAN BENJAMIN.....	418 California St., San Francisco, Cal.....	J. Feb. 6, 1878 M. July 3, 1895
PLATT, JOSEPH CURTIS	Waterford, N. Y.....	July 2, 1895
SMITH, EDWIN FOSTER.....	4514 Chester Ave., Philadelphia, Pa.....	June 5, 1895

ASSOCIATE MEMBERS.

SPIELMAN, JOHN GODFREY.....	Pittsburgh } Bridge Co., } J. March 4, 1891 Pittsburgh, } Assoc. M. May 1, 1895 Pa.....
THOMPSON, CLARK WALLACE.....	La Crosse, Wis. } J. March 5, 1890 } Assoc. M. July 3, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

BUSH, H. D	31 Westinghouse Bldg., Pittsburgh, Pa.
MALTY, F. B.	2902 Ellendale Ave., St. Louis, Mo.
NOURSE, E. G	531 The Rookery, Chicago, Ill.
ROBINSON, G. H	Salt Lake City, Utah.

ASSOCIATE MEMBERS.

HOWARD, C. P	Box 872, Mount Vernon, O.
MOORE, CHARLES H.....	N. Y., L. E. & W. R. R., 21 Cortlandt St., New York City.
SHERREDD, M. R.....	Engineer Water Department, 128 Halsey St., Newark, N. J.

ASSOCIATE.

- WATKINS, J. E. Curator Technological Collection, U. S. National Museum, Smithsonian Institution, Washington, D. C.

JUNIORS.

- BELL, G. J. (Care A. T. & S. F. R. R.), Ft. Madison, Iowa.
 EVANS, M. EDWARD. 129 Lexington Ave., New York City.
 KNAPP, H. M. (Care Variety Iron Works Co.), Works No. 2, Cleveland, O.
 LAWTON, PERRY. 39 Washington St., Quincy, Mass.
 MARTIN, WISNER B. 101 South Eleventh St., Newark, N. J.
 RUILOBA, J. A. Havemeyer Bldg., New York City.

DEATH.

- RUDLOFF, HENRY FREDERIC. Elected Member Jan. 6, 1886; died June 1, 1895.

ADDITIONS TO LIBRARY AND MUSEUM.

- From Board of Trustees, Sanitary District of Chicago:
 Proceedings May 22d and 24th, June 5th, 12th, 1895.
 From Louis de Chasseloup-Laubat, Paris, France:
 Exposition Internationale de Chicago en 1893.
 From Dyckerhoff & Söhne, Amöneburg, Germany:
 Protokoll der Verhandlungen des Vereins Deutscher Portland-Cement Fabrikan-ten und der Section für Cement des Deutschen Vereins für Fabrikation von Ziegeln, Thonwaren, Kalk und Cement am 26. und 27. Februar, 1895.
 From J. B. Henderson, Brisbane, Australia:
 Artesian Water in the Western Interior of Queensland.
 From E. W. Howe, Boston, Mass.:
 First, Third, Fifth, Sixth, Ninth, Tenth, Eleventh and Thirteenth Annual Reports of the Department of Parks, Boston.
 Notes on the Plan of Franklin Park and related matters.
 From Institution of Civil Engineers, London, Eng.:
 Minutes of Proceedings, Vol. CXX.
 From M. R. Jefferts, London, Eng.:
 Agricultural Depression and Light Railways.
 From Charles Mayne, Shanghai, China.
 Volume of Photographs of Shanghai, China.
 From Elwood Mead, Cheyenne, Wyoming:
 Biennial Report of the State Engineer of Wyoming for 1893 and 1894.
 From National Academy of Sciences, Washington, D. C.:
 Proceedings, Vol. 1, Part 3.
 Biographical Memoirs, Vol. III.
 From Edw. P. North, N. Y.:
 Reports on the Works executed by the Commissioners of Sewers of the City of London during the Years 1891, 1892, 1893, 1894.
 From Theodore Paschke, New York:
 Questiones entre Guatemala y Mejico.
 Ferro Carril Central de Guatemala.
 From Maj. Charles F. Powell, Washington, D. C.:
 Report of the Operations of the Engineer Department of the District of Columbia for the year ending June 30th, 1894.
 From Royal Institute of Engineers, Hague, Holland:
 Register, 1889-1894.
 Tidschrift, Verhandelingen, vierde Afdeling.
 Tidschrift, Notulen der Vergaderingen, derde and vierde Afdeling.
 Algemeen Verslag van de Werkzaamheden etc., 1894-1895.
 From Secretary for Mines, Melbourne, Australia:
 Report on the Loss of Gold in the Reduction of Auriferous Veinstone in Victoria.
 From J. Herbert Shedd, Providence, R. I.:
 Annual Report of the City Engineer of the City of Providence for the year 1894.
 From George D. Snyder, Williamsport, Pa.:
 Mayor's Message. City Controller's Report and Reports of Departments of the City of Williamsport, Pa., for the year 1894.
 From C. L. Thompson, Kingston-on-Thames, England:
 A Catalogue of Books, Reports, Papers and Articles relating to Light Railways.
 From J. M. DeVarona, Brooklyn, N. Y.:
 Annual Report of the Commissioner of City Works of the City of Brooklyn for the year 1894.
 From Western Society of Engineers, Chicago, Ill.:
 Constitution, By-Laws and List of Members, June, 1895.

American Society of Civil Engineers

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MEMOIRS OF DECEASED MEMBERS.

CHARLES FREDERIC BEALS HASKELL, M. Am. Soc. C. E.

DIED MAY 20TH, 1895.

Charles Frédéric Beals Haskell was born in Washington, D. C., November 28th, 1856, and graduated from the Department of Civil Engineering of the University of Vermont in 1880. From April, 1880, to February, 1882, he was engaged on the Michigan Central Railroad as leveler, and later had charge of 10 miles of heavy work during construction, and in 1882 and 1883 was similarly engaged on roads in Pennsylvania. In 1884 he was engaged on the location and construction of the Burlington, Cedar Rapids and Northern Railway. In 1885, he was division engineer in charge of construction on the St. Paul and Northern Pacific "Short Line" between St. Paul and Minneapolis, and in the following year held a similar position on the Chicago, Burlington and Northern Railroad. In 1886 he was engaged in the location of several roads in Minnesota. From October, 1886, to February, 1888, he was in charge of 150 miles of location and construction on the St. Paul, Minneapolis and Manitoba Railway, and in the following year was division engineer on location and construction with the Winona and Southwestern Railway. From December, 1889, to September, 1890, he had charge of explorations for the Great Northern Railway in Montana, Idaho and Washington, and was subsequently in charge of location in the Cascade Mountains for the same company.

He engaged later in business in Wenatchee, Wash., and was also interested in irrigation enterprises in that part of the country.

In 1894 he became connected with the government works for the improvement of the Columbia River. At the time of the accident in which he lost his life, he was crossing the river with two other persons in a skiff. The boat was caught in a whirlpool and overturned, and all the party drowned. He leaves a widow and one son.

His most important engineering work was probably the discovery of Stevens Pass through which the Great Northern Railway crosses the Cascade Range. In the summer of 1890 he was sent to explore Nason Creek, a branch of the Wenatchee River, to its source. Accompanied by Mr. W. F. C. Whyte and a single packer, he worked his way up the valley, which had apparently never been penetrated, and finally found a gap in the summit range through which he crossed to the headwaters of the Skykomish. He followed this stream down to Index, where a canoe was secured and the journey continued to Sultan. A subsequent examination of this route by E. H. Beckler, M. Am. Soc. C. E., then chief engineer of the Great Northern Railway, and John F. Stevens, M. Am. Soc. C. E., the present chief engineer, showed that this crossing gave the shortest distance, best grades and shortest tunnel of any examined and was therefore selected. The name was given the pass by Mr. Haskell, who carved it on a tree at the summit of the divide during his reconnaissance.

Mr. Haskell was elected a Member of the American Society of Civil Engineers on October 7th, 1891.

FRANK CHESTER BEARDSLEY, M. Am Soc. C. E.

DIED JULY 1st, 1895.

Frank Chester Beardsley was born at Bloomington, Wis., September 21st, 1860. He graduated in 1883 from the engineering department of the University of Wisconsin, and soon began active work as instrument man on municipal and land surveys with Mr. J. C. Scott, of Lancaster, Wis. From July, 1885, to December, 1886, he was instrument man and assistant to the resident engineer of the Chicago, Burlington and Northern Railway. From February, 1887, to December, 1889, he served as resident engineer of the Elgin, Joliet and Eastern Railway, being in charge of construction for two years and in charge of a party on location for nine months. He then spent two years with the Chesapeake and Ohio Railway as resident and locating engineer, and was afterward engaged in general practice in Chicago. In November, 1893, he became engineer in charge of the Turkey Knob Coal Com-

pany at Macdonald, W. Va., being employed in the location and construction of railways, topographical surveys, and the design and construction of mining plant. This position he held until his death, which occurred July 1st, 1895, at Macdonald.

Mr. Beardsley had prepared and copyrighted tables for the calculation of earthwork, but had never offered them for publication, although they had been used by engineers associated with him. It was his intention to print them as an appendix to a field-book for engineers on which he was engaged at the time of his death.

Mr. Beardsley was elected a Member of the American Society of Civil Engineers November 7th, 1894. He leaves a widow and two daughters.

JOHN FREDERIC TEMPLE, Assoc. M. Am. Soc. C. E.

DIED JULY 21ST, 1895.

John Frederic Temple was born at Burlington, Ia., March 22d, 1865. He graduated from the Department of Civil Engineering of the Worcester Polytechnic Institute in 1888, and at once began work as draftsman in the Topeka offices of the Atchison, Topeka and Santa Fé Railroad. In a few months he left this position to become draftsman on the Northern Pacific Railroad, where he remained until June, 1889, being chief field draftsman on the Butte Short Line for a part of the time. While coming East to accept a position with the Edge Moor Bridge Works, he was severely injured in a railway accident and was unable to do any work for some time. After recovering he spent a short time in the shops of the Dominion Bridge Company at Montreal and in the drafting rooms of the Pencoyd Bridge and Construction Company. From October, 1889, to August, 1890, he was detail engineer of the Edge Moor Bridge Works, and for the next year he was engineer in charge of designing and drafting of the American Bridge and Iron Works at Roanoke. From July, 1891, to July, 1892, he was chief draftsman of the San Francisco Bridge Company at Seattle. In July, 1892, he again entered the service of the Atchison, Topeka and Santa Fé Railroad and was soon appointed chief draftsman, a position he held until the fall of 1894, when he was appointed office and bridge engineer of the Choctaw, Oklahoma and Gulf Railroad, which position he held at the time of his death.

Mr. Temple lost his life by drowning at South McAlester, I. T., July 21st, 1895. He was elected a Junior of the American Society of Civil Engineers February 5th, 1890, and an Associate Member October 4th, 1893. He leaves a widow and two children.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.	
BLAKESLEE, CLARENCE.....	Engineer's office, N. Y., N. H. & H. R. R., New Haven, Conn.....	June 4, 1895	
BOGART, JAMES PETER.....	291 Washington Ave., { J. Jan. 4, 1882 Bridgeport, Conn.. { M. July 3, 1895		
DE RAASLOFF, HAROLD EDWARD....	Chief Assistant Engineer St. L. S. W. Ry., Texarkana, Tex.....	{ J. Sept. 3, 1884 M. July 3, 1895	
ELLIS, JOHN WALDO.....	Woonsocket, R. I.....	July 3, 1895	
HAMLIN, GEORGE HERBERT.....	Main State College, Orono, Me.....	July 3, 1895	
OTIS, GEORGE ELLISON.....	Locating Engineer, Philadelphia Construction Co., Mansfield, Ark.....	July 3, 1895	

ASSOCIATE MEMBERS.

CORNER, CHARLES.....	Engineer Railroad Commission, Austin, Tex....	May 1, 1895	
FARRINGTON, HARVEY.....	Croton-on-Hudson, N. Y.....	{ J. June 19, 1891 Assoc. M. Feb. 6, 1895	
HAWLEY, JOHN BLACKSTOCK.....	Consulting Engineer Water Works, Fort Worth, Tex.	May 1, 1895	
KHVEN, RICHARD, Jr.....	Pencoyd Iron Works, Pencoyd, Pa....	{ J. Dec. 3, 1891 Assoc. M. May 1, 1895	
LENTILHON, EUGÈNE.....	36 West Eleventh St., New York City..	{ J. Mar. 1, 1891 Assoc. M. Mar. 6, 1895	
MARTIN, WISNER BELL.....	101 South Eleventh St., Newark, N. J.....	{ J. May 3, 1892 Assoc. M. July 3, 1895	
STENGER, ERNEST.....	City Engineer's office, Omaha, Neb.....	June 5, 1895	
TRASK, FRANK ELLSWORTH.....	P. O. Box 133, Ontario, Cal.....	June 5, 1895	
WHEATLEY, ARTHUR CORNWALLIS..	Ibo, Cabo Delgado, East Africa..	{ J. May 7, 1890 Assoc. M. Mar. 6, 1895	

JUNIORS.

FRENCH, CHARLES AUGUSTUS.....23 Clement St., Malden,
Mass..... March 5, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

ANDREWS, D. M..... U. S. Engineer's office, Montgomery, Ala.
BENSEL, JOHN A..... 29 Broadway, New York City.
BUSH, H. D..... Box 386, Sharpsburg, Pa.
BRACKETT, DEXTER..... Engineer Distribution Dept., Metropolitan
Water Board, State House, Boston, Mass.
CISNEROS, F. J..... 39 Coleman St., London, E. C., England.
DORSEY, EDWARD BATES..... (Care City Safe Deposit Co.), 50 Throck-
morton Ave., London, England.
DUNLAP, D. C..... 78 State St., Room 63, Chicago, Ill.
ECKERT, E. W..... 15 Tompkins Ave., New Brighton, N. Y.
GILES, ROBERT..... 1309 Central Ave., North Topeka, Kans.
GRISWOLD, FRANK L..... La Rioja, Argentine Republic.
HUGHES, WILLIAM M..... 768 Rookery Bldg., Chicago, Ill.
KIELLAND, S. M..... 351 Humboldt Parkway, Buffalo, N. Y.
MCCOLLOM, THOMAS C..... Civil Engineer U. S. N., 97 Pierrepont St.,
Brooklyn, N. Y.
MORRIS, GOUVERNEUR..... 123 Alfred St., Detroit, Mich.
SHAW, SUMNER F..... (Care U. S. Consul), Guatemala City, Cen-
tral America.
SLATAFER, FELICIAN..... Via S. Martiri No. 13, Trieste, Austria.
STEARNS, FREDERIC P..... Chief Engineer Metropolitan Water Board,
State House, Boston, Mass.
STEPHENS, C. F..... General Manager St. Louis, Belleville &
Southern Ry., St. Louis, Mo.
TODD, F. H..... Chief Engineer Sonora and Sinaloa Irriga-
tion Co., Cocorit, Sonora, Mexico.
VAN AUKEN, A. M..... 78 State St., Chicago, Ill.
WELLS, CHARLES E..... Lock Box 1045, Clinton, Mass.
WILLIAMSON, F. STUART..... 44 Broadway, New York City.
WROTNOWSKI, ARTHUR F..... General Manager Vera Cruz Harbor Works,
Vera Cruz, Mexico.

ASSOCIATE MEMBERS.

BALDWIN, H. E..... 221 Crawford Road, Cleveland, Ohio.
GIBBS, CHARLES W..... Engineer Suffolk Globe Mining and Milling
Co., Ophir, Colo.
GRAVES, E. D..... Box 1023, Middletown, Conn.
HEMMING, D. W..... 367 West 117th St., New York City.
HOWARD, C. P..... (Care Haskell and Townsend), Lima, Ohio.
LUND, GEORGE A..... 106 West 61st St., New York City.

MORLEY, FRED.....	Lafayette, Ind.
SISSON, WILLIAM LEE.....	Resident Engineer Columbia and Maryland Ry., Ilchester, Md.

JUNIORS.

CARTER, WILLIAM.....	2042 Woodland Hills Ave., Cleveland, Ohio.
KNOWLES, MORRIS.....	Assistant Engineer Metropolitan Water Board, State House, Boston, Mass.
LUDWIG, ALFRED.....	(Care Brown Hoisting and Conveying Machine Co.), Hamilton and Belden Sts., Cleveland, Ohio.
McKENNEY, CHARLES A.....	Assistant Engineer in charge, Sewerage System, Fort Monroe, Va.
SHERMAN, CHARLES W.....	1 Berkeley St., Cambridge, Mass.
THOMPSON, M. J.....	(Care SooySmith & Co.), Mills Bldg., New York City.
TRAVELL, WARREN B.....	Johnsonville, N. Y.
VANDERLIP, H. E.....	211 Marion St., Elkhart, Ind.
VILLALON, JOSÉ R.....	Central Valley, Orange Co., N. Y.
WHITE, ROBERT D.....	518 Arch St., Philadelphia, Pa.

DEATHS.

BEARDSLEY, FRANK CHESTER.....	Elected Member, November 7, 1894; died July 1, 1895.
COBB, ROBERT LINAH.....	Elected Member, January 2, 1890; died (date not yet ascertained).
TEMPLE, JOHN FREDERIC.....	Elected Junior, February 5, 1890; elected Associate Member, October 4, 1893; died July 21, 1895.
TIDD, MARSHALL M.....	Elected Member, October 2, 1878; died August 20, 1895.

ADDITIONS TO

LIBRARY AND MUSEUM.

From American Institute of Architects,
Providence, R. I.:
Proceedings of Twenty-eighth Annual
Convention, 1894.

From American Institute of Mining En-
gineers:
The Equipment of Mining and Metal-
lurgical Laboratories.
The Physics of Cast Iron.
The Determination of Graphite in Pig
Iron.

The Effect of Washing with Water upon
the Silver Chloride in Roasted Ore.

Onyx Marbles.

Folds and Faults in Pennsylvania An-
thracite Beds.

A Comparison of Recent Phosphorus De-
termination in Steel.

The Form of Fissure Walls, as Affected
by Sub-Fissuring and by the Flow of
Rocks.

- From American Society of Irrigation Engineers, Denver, Colo.:
Quarterly, Vol. II, No. 1.
- From Board of Public Works, Duluth, Minn.:
Eighth Annual Report for the Year ending February 28th, 1895.
- From Board of Trustees, Sanitary District of Chicago:
Proceedings, June 26th, July 2d, 10th and 21st, August 1st, 14th and 21st, 1895.
- From Boston Society of Civil Engineers:
List of Members, May, 1895.
- From C. W. Bradley, New York:
International Railway Congress Journal, June 25th to July 10th, 1895.
- From Canal Commission of Philadelphia, Pa.:
Report of the Canal Commission of Philadelphia, June 4th, 1895.
- From Charles Corner, Austin, Tex.:
County Roads.
- From Department of Public Works, Chicago, Ill.:
Nineteenth Annual Report for the Year ending December 31st, 1894.
- From Director-General of Railways, Simla, India:
Administration Report on the Railways in India for 1894-95. Part I.
- From Albert B. Drake, New Bedford, Mass.:
Sixth Annual Report of the Board of Public Works of the City of New Bedford for the Year 1894.
- From G. W. Ettenger, London, Eng.:
Two Lithographs of Standard Underframes for Cars.
- From Geo. S. Greene, Jr., New York:
Annual Reports of the Canal Commissioners of Pennsylvania, December 9th, 1837. December 27th, 1838.
- Thirteenth Annual Report of the Board of Commissioners of the Central Park, 1869.
- Prize Essays on Road-Making, 1870.
- Remarks upon the Defects of Railway Tracks and their Remedy.
- Report of the Canal Board (N. Y.) in relation to Honeoye, Conesus and other Lakes, 1850.
- An Act to Incorporate a Company for the Construction of a Ship Canal to Connect the Waters of Lake Champlain and the River Saint Lawrence.
- Origin and History of the Measures that led to the Construction of the Erie Canal, 1866.
- Survey and Estimate of the Casco and Kennebec Canal, 1835.
- Report of the Secretary of the Treasury on the Subject of Public Roads and Canals, 1807.
- Account of the Proposed Canal from Worcester to Providence, 1825.
- Report of the Chesapeake and Ohio Canal Company, 1839.
- Report of the Committee on Roads and Canals (H. R.) in Relation to the Route, Plan and Estimated Cost of the Chesapeake and Ohio Canal, 1827.
- Arguments in favor of the New Avenue to the (Bunker Hill) Monument, 1859.
- Maps of Androscoggin and Cobscookcountee Rivers. Survey of Kennebec River.
- Annual Reports of the Railroad Corporations in the State of Massachusetts for 1853, 1854.
- Third Annual Report of the Commission on Steam on the Canals (New York), Feb. 20, 1874.
- The Washington Canal.
- Great Falls Manufacturing Company vs. The United States.
- The Silver Mines of Nevada.
- Defective Drainage of Dwelling Houses.
- The Growth of New York.
- Reports on Water Meters.
- Bridging and Masonry.
- Street Roadway Pavements.
- On the Harrison Steam Boiler.
- Report on the Uses of a Topographical Survey to the State of New York.
- Report on Plans and Improvements of Fairmount Park.
- Canvaas of Proposals for the Construction of the Storage Reservoir in Hempstead Valley.
- Lead Pipe: Its Danger.
- From Elmo G. Harris, Rolla, Mo.:
The Theory of the Air-Lift Pump.
- From Charles Hensel, Easton, Pa.:
Protection of Grade Crossings of Steam Railroads with Electric Railways, and Protection of Facing Point Switches.
- From Institution of Civil Engineers, London, England:
Minutes of Proceedings, Vol. cxi.
- From Institution of Mechanical Engineers, London, Eng.:
Proceedings, January, 1895.
- From Iowa State Board of Health, Des Moines, Ia.:
Iowa Health Bulletin, July, 1895.
- From William Jackson, Boston, Mass.:
Annual Reports of the City Engineer, Boston, for the years 1874, 1887, 1888, 1891 and 1894.
- From Junior Engineering Society, London, England:
Record of Transactions, Vol. IV, 1893-94.
- From J. Francis Le Baron, Jacksonville, Fla.:
Map of the City of Jacksonville, Fla.
- From Master Car-Builders' Association, Chicago, Ill.:
Report of the Proceedings of the Twentieth Annual Convention, June 11th to 14th, 1895.
- From James R. Maxwell, Philadelphia, Pa.:
Railway Construction on the Peruvian Andes.
- From Minister of Public Works, Paris, France:
Commission des Méthodes d'Essai des Matériaux de Construction, Tome IV (Matériaux d'Aggrégation des Maçonneries)
- From North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England:
Report of the Proceedings of the Flameless Explosives Committee.
- From H. V. & H. W. Poor, New York:
Poor's Manual of Railroads for 1895.

- From Ransome Subway Company, Chicago, Ill.:
Monolithic Subways, Sewers, Electric Conduits, Drains, Cable and Electric Roads, etc.
- From J. Herbert Shedd, Providence, R. I.:
Annual Reports of the City Engineer, Providence, R. I., for 1872, 1873, 1874, 1877, 1878, 1880 to 1889.
Report of the Chief Engineer of Providence Water Works, January, 1871.
Report of a Committee of the City Council appointed to examine the sources of Water Supply for the City of Providence, R. I., October, 1868.
Report on Sewerage in the City of Providence, R. I., February, 1874.
Report on the System of Sewerage in the City of Providence, R. I., made by a Committee of the American Society of Civil Engineers, August 7th, 1876.
- From M. T. Singleton, Rockmart, Ga.:
Gravitation and Cosmological Law, A Mathematical Demonstration of the Secret of Gravitation and Attendant Phenomena.
- From Hamilton Smith, London, Eng.:
Superintendent's Report Alaska Treadwell Gold Mining Company for the Year ending May 31st, 1895.
- From Technical High School at Aix-la-Chapelle, Germany:
Program for 1895-96.
- From Technical High School, Berlin, Germany:
Program for 1895-96.
- From Technical High School in Hanover, Germany:
Program for 1895-96.
- From John C. Trautwine, Jr., Philadelphia, Pa.:
Annual Reports of the Bureau of Water for 1890, 1891, 1893 and 1894.
Annual Reports of the Bureau of Highways for 1888, 1890, 1891 and 1892.
Annual Message of the Mayor with Bureau Reports for 1893 and 1894; 8 vols.
- From U. S. Civil Service Commission:
Eleventh Report, July 1st, 1893, to June 30th, 1894.
- From U. S. Department of the Interior:
Report on the Population of the United States at the Eleventh Census, 1890. Part I.
- From U. S. Geological Survey:
Folios 1 to 6, and 8 to 12, of the Geologic Atlas of the United States.
- From the U. S. Navy Department:
Pilot Chart of the North Atlantic Ocean, August, 1894.
List and Stations of the Commission and Warrant Officers of the Navy of the United States.
- From U. S. Treasury Department. Bureau of Statistics:
Finance, Commerce and Immigration of the United States, July 31st, 1895.
- From U. S. War Department, Chief of Engineers:
Sixteen Specifications for the Improvement of Certain Rivers and Harbors. Analytical and Topical Index to the Reports of the Chief of Engineers upon Works and Surveys for River and Harbor Improvement, Vol. III, 1888-1892.
- From University of the State of New York, Albany, N. Y.:
State Library Bulletins. Bibliography, No. 1; Additions, No. 2.
State Library Bulletin, Public Libraries, No. 3, June, 1895.
- From P. Vedel, Chicago, Ill.:
Le Port Franc de Copenhagen.
- From L. F. Vernon-Harcourt, London, Eng.:
Brief Notices of Works; Portland Harbour; The Severn Tunnel, etc.
- From G. G. Webster, Philadelphia, Pa.:
Annual Reports of Bureau of Surveys of Philadelphia for 1867, 1873, 1874, 1883 to 1890 and 1893.
- From Bertrand T. Wheeler, Boston, Mass.:
Annual Reports of the Street Department of the City of Boston for 1892, 1893 and 1894.
- From H. D. Woods, Newton, Mass.:
Annual Report of the City Engineer for the Year 1894.

American Society of Civil Engineers.

PROCEEDINGS.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

SEPTEMBER 4TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Chas. Warren Hunt, Secretary, and present, also, 67 Members and 7 visitors.

Minutes of the meetings of June 5th and of the 27th Annual Convention were adopted as printed in the *Proceedings* for June, 1895.

The Secretary announced the election by the Board of Direction September 3d, 1895, of the following Juniors:

JAMES CHURCHILL BOYD, Houlton, Me.
ALBERT SEARS CRANE, Brooklyn, N. Y.
CLIFFORD STEBBINS JENNINGS, Brooklyn, N. Y.
WILLIAM NOYES TAINTOR, New York City.

Ballots were canvassed, and the following candidates were declared elected as Associate Members:

JOSEPH HENRY CLARK, Chicago, Ill.
EDWIN DURYEA, Jr., Carmel, N. Y.
EDWARD LOVEING INGRAM, Buffalo, N. Y.
CHARLES FREDERICK TAYLOR, Syracuse, N. Y.

The following deaths were announced :

FRANK CHESTER BEARDSLEY, elected Member November 7th, 1894; died July 1st, 1895.

ROBERT LINAH COBB, elected Member January 2d, 1890; date of death unknown.

HENRY FREDERICK RUDLOFF, elected Member January 6th, 1886; died June 1st, 1895.

JOHN FREDERICK TEMPLE, elected Junior February 5th, 1890; Associate Member, October 4th, 1893; died July 21st, 1895.

MARSHALL M. TIDD, elected Member October 2d, 1878; died August 20th, 1895.

A paper by A. McL. Hawks, Jun. Am. Soc. C. E., entitled, "A High Speed Gravity Filter Bed," was read by the Secretary, as were also written discussions by Messrs. Allen Hazen, S. Bent Russell, Edmund B. Weston, John W. Hill and Joseph B. Rider, and the subject was discussed orally by Messrs. Rudolph Hering, J. J. R. Croes and Henry C. Meyer.

Adjourned.

SEPTEMBER 18TH, 1895.—The Society met at 20 o'clock, Past President William E. Worthen in the chair; Chas. Warren Hunt, Secretary, and present, also, 80 Members and 15 visitors.

A paper entitled "Notes on High Masonry Dams" was presented by the author, John D. Van Buren, M. Am. Soc. C. E., and written discussions by Messrs. Kenneth Allen, C. M. Broomall and M. S. Parker were read by the Secretary, after which the subject was discussed orally by Messrs. Edward Wegmann, Jr., Robert Ridgeway, William E. Worthen, J. J. R. Croes, F. W. Skinner, T. C. Clarke, G. Lindenthal and the author.

Adjourned.

OF THE BOARD OF DIRECTION.

(ABSTRACT.)

SEPTEMBER 3D, 1895.—Nine members present.

The following resolution was adopted :

Whereas, The Board of Direction of the American Society of Civil Engineers desires to give expression to its appreciation of the courtesies received from the Maine Central Railroad Company, on the occasion of visit of the Society to the White Mountains, in June, 1895; be it therefore

Resolved, That the thanks of the Society are hereby tendered to William A. Allen, Chief Engineer, and to the Maine Central Railroad Company, for the special trains placed at its disposal on that occasion, which added so much to the comfort and convenience of its Members.

The following resolution was adopted :

Resolved, That the Board of Direction of the American Society of Civil Engineers has learned with deep regret of the sudden death of

Mr. E. F. C. Davis, President of the American Society of Mechanical Engineers.

Resolved, That this Board desires to express to the Council of the American Society of Mechanical Engineers its sincere sympathy and its deep sense of the great loss which that Society has sustained.

H. V. Hinckley, M. Am. Soc. C. E., was appointed a delegate from this Society to the Fourth International Congress, at Albuquerque, N. M.

Applications were considered and other routine business transacted.

LIST OF MEMBERS.

ADDITIONS.

ASSOCIATE MEMBERS.		Date of Election.
DURYEA, EDWIN, Jr.....	46 East 21st St., { J. New York City. } Assoc. M.	Feb. 2, 1887 Sept. 4, 1895
INGRAM, EDWARD LOVERING	403 D. S. Morgan Bldg., Buffalo, N. Y.....	Sept. 4, 1895
TAYLOR, CHARLES FREDERICK...	Syracuse Water Board, Syracuse, N. Y.	Sept. 4, 1895

JUNIORS.

CRANE, ALBERT SEARS	Room 47, Municipal Bldg., Brooklyn, N. Y.....	Sept. 3, 1895
TAINTOR, WILLIAM NOYES	Greenwich, Conn.	Sept. 3, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

ALLEN, KENNETH.....	(Care Sewerage Commission), Equitable Bldg., Baltimore, Md.
BLACK, WM. M.....	Captain Corps of Engineers, Assistant to Chief of Engineers U. S. A., War Dept., Wash- ington, D. C.
BRECKENRIDGE, CABELL	Rockwood, Tenn.
SMITH, JOSEPH S.....	(Care Robt. S. Perry), Cave Spring, Ga.
STEVENS, H. E.	530 Grand Ave., St. Paul, Minn.
SWAN, CHARLES H.	Office of Boston Transit Commission, 20 Beacon St., Boston, Mass.
TODD, F. H.....	(Care C. A. Scott), 110 Tremont St., Boston, Mass.

- Report of the Survey of the Bangor, Orono and Oldtown Railroad, February 18th, 1850.
- Report of the Boston and Lowell Railroad Corporation, November 30th, 1837.
- Argument of Hon. Daniel Webster in behalf of the Boston and Lowell Railroad Company, January 20th, 1845.
- Report of the Boston and Maine Railroad, 1836.
- Annual Reports of the President, Engineer and Treasurer of the Covington and Lexington Railroad, January, 1852.
- Charter of the Covington and Lexington Railroad Company, 1849.
- Report of the Examinations and Surveys for a Railroad Route for the Franklin and Kennebec Railroad Company.
- Report of the Kennebec and Portland Railroad Company, October 5th, 1848; October 4th, 1849; and Annual Report for 1852.
- Report of a Survey and Estimates for a Railroad from Portland to Augusta and Bath, in Maine, 1846.
- Freight Tariff of the Kennebec and Portland Railroad, 1851.
- Report of Survey and Estimates of the Keweenaw and Cliff Railroad, April 16th, 1864.
- Report of a Survey and Estimate for a Railroad from Lewiston Falls to Rumford Falls, Maine, 1849.
- Annual Reports of Louisville, Cincinnati and Charleston Railroad Company for 1836 and 1837.
- Address on the Proposed Louisville, Cincinnati and Charleston Railroad, 1836.
- Annual Report of the Lexington and Danville Railroad Company, May 6th, 1856.
- Report of the Joint Committee to the Directors of the Mansfield and Sandusky and of the Columbus and Lake Erie Railroad Companies, December 8th, 1848.
- Massachusetts Railroads, 1842 to 1855.
- Report on the Subject of a Railroad Track on the Marginal Streets of the City of Boston, December 4th, 1851.
- Contract and Specifications for the Grading, Masonry, Bridging and Track-Laying of the New Haven and Derby Railroad Company, October 5th, 1867.
- Report on the Extension of the Orange and Alexandria Railroad, February 1854.
- Proceedings of the Sixth, Eighth and Ninth Annual Meetings of the Orange and Alexandria Railroad Company, 1855, 1857 and 1858.
- A Survey of Routes for a Railroad between Portsmouth and Newburyport, 1835.
- Report on the Survey of the Portsmouth and Newburyport Railroad, 1836.
- Rules and Regulations for the Management of the Providence, Warren and Bristol Railroad, 1857.
- Report on the Providence and Bristol Railroad, May 13th, 1852.
- Charter and By-Laws of the Providence, Warren and Bristol Railroad Company, October, 1850.
- Proceedings of a Convention holden at Dover, N. H., September 29th, 1835, on the Subject of a Railroad from Portland to Boston.
- Report of a Survey and Estimate for a Railroad from Waterville to Bangor, Maine, May 1st, 1848.
- Substance of Argument on the Application of the Seekonk Branch Railroad Company to run Locomotive Engines on the Providence and Worcester Railroads, 1838.
- Report on the Surveys of the Providence and Plainfield Railroad, December 13th, 1847.
- Statement of the Condition and Prospects of the Rock Island and Peoria Railroad Company, July, 1856.
- From Eduardo J. Habich, Lima, Peru: Escuela de Ingenieros de Construcciones Civiles y de Minas.
- From Malverdi A. Howe, Terre Haute, Ind.: Bridge Deflections.
- From Institution of Civil Engineers, London, Eng.: Catalogue of the Library of the Institution of Civil Engineers.
- From E. H. Keating, Toronto, Canada: Annual Report of the City Engineer of Toronto for 1894.
- From Liverpool Engineering Society, Liverpool, Eng.: Transactions, Vol. XVI.
- From J. J. McVean, Grand Rapids, Mich.: Twenty-second Annual Report of the Board of Public Works, Grand Rapids, Mich., for the fiscal year ending April 30th, 1895.
- From New England Cotton Manufacturers' Association, Boston, Mass.: Transactions of Annual Meeting April 24th, 25th, 1895.
- From Royal Society of Canada, Ottawa, Canada: Proceedings and Transactions, Vol. XII.
- From Surgeon's General's Office, U. S. Army: Index Catalogue, Vol. XVI.
- From U. S. Department of Agriculture, Weather Bureau: Monthly Weather Review, Annual Summary for 1894.
- From U. S. Geological Survey: Fourteenth Annual Report, Parts I and II.
- From U. S. Ordnance Office: Notes on the Construction of Ordnance No. 65, Rifling of Modern Guns.
- From U. S. Treasury Department, Bureau of Statistics: Finance, Commerce and Immigration of the United States. No. 1, Series 1895-96.
- From W. Hasell Wilson, Philadelphia, Pa.: A Brief Review of Railroad History from the earliest period to the year 1894.
- By Exchange: Maximum Stresses from Moving Single Loads on the Members of Three-Hinged Arches.

BOOK NOTICES.

THE MECHANICAL ENGINEER'S POCKETBOOK.

A Reference Book of Rules, Tables, Data and Formulæ, for the Use of Engineers, Mechanics and Students. By William Kent, A. M., M. E., etc. Limp morocco, $6\frac{1}{2} \times 4$ ins., pp. XXI + 1087. New York, John Wiley & Sons, 1895.

More than twenty years before the appearance of this pocketbook, the author began to collect engineering facts and figures, and about 1890 he commenced arranging and abridging these data to form a handy reference book on mechanical engineering. An examination was also made of the transactions of engineering societies, recent works on mechanical engineering, and technical journals. In collating for publication the mass of information thus accumulated, it was decided to give as little space as possible to subjects belonging especially to civil engineering, as Trautwine's "Civil Engineer's Pocketbook" covered that field. The author gives the originators of the rules in the manual, when they were known to him, and the volume and page of the book from which they were taken. Several different formulas are given frequently for the same problem, and where they lead to widely varying numerical results, a new formula is sometimes deduced.

The contents of the book are divided as follows: Mathematics, 162 pages; the properties of engineering materials, 253 pages; mechanics, 33 pages; heat, 31 pages; the physical properties of gases, 47 pages; heating and ventilation, 19 pages; hydraulics and hydraulic apparatus, 73 pages; fuel, boilers, engines driven by steam, gas, petroleum and hot air, and the locomotive, 247 pages; shafting, pulleys, belting, gearing, hoisting appliances, wire rope transmission, rope driving, friction and lubrication, 79 pages; foundry practice, 7 pages; machine shop practice and dynamometers, 28 pages; ice and refrigerating machinery, 20 pages; marine engineering, 18 pages; building construction, 5 pages; electric engineering, 47 pages. The book closes with an index occupying a number of pages.

The typography, paper, press-work and binding are much the same as in Trautwine's "Civil Engineer's Pocketbook."

DIE MASCHINELLEN HILFSMITTEL DER CHEMISCHEN
TECHNIK.

By A. Parnicke, late Chief Engineer of the Griesheim Chemical Works. Paper, $6\frac{1}{2} \times 9\frac{1}{2}$ ins., pp. VIII + 320, 337 illustrations. Frankfurt, H. Bechhold, 1894.

The object of this book, according to the preface, is to furnish young graduates of technical schools with information concerning the mechanical apparatus used in chemical works, as there are few German schools which pay much attention to this subject. On account of the great variety of mechanical appliances employed in the numerous branches of chemical technology the space devoted to each class is necessarily limited and the author describes most fully the apparatus with which he has had personal experience.

The contents of the book are as follows: Introduction, 27 pages; prime motors and boilers, 48 pages; apparatus for transmitting power, 7 pages; tramways, cars, elevators, cranes, pumping and ventilating appliances, 44 pages; grinding and crushing mills, 23 pages; mixing machinery, 14 pages; melting and dissolving apparatus, 12 pages; concentrating apparatus, 27 pages; appliances for mechanical separation, including those used in distillation, crystallization and sublimation, 46 pages; drying apparatus, 21 pages; appliances for the measurement of weight, pressure, temperature and draught, 17 pages; German laws and regulations concerning the management of mechanical apparatus in chemical works, 29 pages; index, 6 pages.

ERRATUM.

PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS,
VOL. XXI.

Page 191, 7th line from top: For "International" read "Irrigation."

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American Society of Civil Engineers.

PROCEEDINGS.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

OCTOBER 2d, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 77 Members and 14 visitors.

Minutes of the meetings of September 4th and 18th were adopted as printed in BULLETIN No. 64, dated September 25th, 1895.

The Secretary announced the election by the Board of Direction, October 1st, 1895, of the following:

AS ASSOCIATE.

RUTLEDGE IRVING ODELL, Tomkins Cove, N. Y.

AS JUNIORS.

CHARLES ALBERTSON, Bangor, Pa.

MORTON CLARKE ANDREWS, Terre Haute, Ind.

JAMES FERGUSON BURNS, Evansville, Ind.

HARRY BLAKEMAN LEWIS, New York City.

ALEXANDER MILLER TODD, Arkansas City, Ark.

Ballots were canvassed, and the following candidates were declared elected :

AS MEMBERS.

ARTHUR LINCOLN ADAMS, Astoria, Ore.
MIGUEL DE TEIVE E ARGÔLLA, Alagoinhas, Bahia, Brazil.
GEORGE HENRY BLAKELEY, Paterson, N. J.
CHARLES CARROLL BROWN, Indianapolis, Ind.
ROBERT ANDREW CAIRNS, Waterbury, Conn.
PHILIP WILLIAM CHAMBERLAIN, Guatemala, Guatemala.
GEORGE B. CHRISTIE, Chicago, Ill.
GEORGE HERRICK DUGGAN, Montreal.
GUSTAVE JOSEPH FIEBEGER, Washington, D. C.
JOHN HENRY GRAY, Chicago, Ill.
HENRY WILSON HODGE, New York City.
NELSON PETER LEWIS, Garden City, N. Y.
JESSE LOWE, Chicago, Ill.
J. Y. MCCLINTOCK, Rochester, N. Y.
DAVID ERNEST MELLISS, San Francisco, Cal.
CHARLES MORTON, Boston, Mass.
EDWARD SAWYER, Newton, Mass.

AS ASSOCIATE MEMBERS.

JOHN BENJAMIN BODY, Mexico, Mexico.
WENDELL PHILLIPS BROWN, Cleveland, O.
FREDERICK J. GUBELMAN, Allegheny, Pa.
WILLIAM WRIGHT HARTS, Newport, R. I.
ERSKINE HAZARD, South McAlester, I. T.
JULIUS ALFRED LUDWIG, Washington, D. C.
SAMUEL STORROW, North Yakima, Wash.
THOMAS ULVAN TAYLOR, Austin, Tex.
YOSHICHIKA WADA, Gunbaken, Japan.
GARDNER STEWART WILLIAMS, Detroit, Mich.

The Secretary presented the following report of the action taken by the Board of Direction October 1st, 1895, in regard to the proposed International Institute of Engineers and Architects:

At the Annual Convention a communication was presented to the Society by E. L. Corthell, M. Am. Soc. C. E., entitled "Résumé of Correspondence from Engineering Societies Relating to Establishing Closer International Relations," and on his motion "the subject covered by this communication was referred to the Board of Direction, with the request that they give the matter careful consideration and action."

The Board of Direction has carefully considered the whole matter, and is heartily in accord with what appears to be the prevailing sentiment in favor of cultivating continued closer and fuller relations be-

tween the engineering societies of the civilized world. It believes, however, that the true means of attaining the desired end would not be found in an international institute, and agrees with the view so well and clearly expressed on behalf of the German Association of Engineers and Architects by our Corresponding Member, Mr. Charles Otto Gleim, of Hamburg, as to the present desirability of limiting the scope of the movement toward union and following up the course inaugurated at Chicago in 1893, by a series of International Congresses, "leaving to future development the question whether these congresses will gradually grow into a more permanent organization."

In the judgment of the Board of Direction, therefore, it is not expedient for the American Society of Civil Engineers, at this time, to take any steps toward the formation of an International Institute of Engineers and Architects, but that, as a society, it should hold itself in readiness to participate cordially in all efforts to put upon an enduring basis the kindly social and technical relations which marked the Engineering Congress at Chicago, through a series of future similar gatherings.

The Secretary announced that the following appointments for the current year had been made by the Board of Direction, and that all the gentlemen named had accepted:

The Board of Censors to award the Norman Medal: Messrs. Robert Moore, Charles Walker Raymond and Palmer C. Ricketts.

The Committee to award the Rowland Prize: Messrs. Charles L. Strobel, William Rotch and the Secretary.

The following list of nominees presented by the Nominating Committee for the offices to be filled at the next annual election was announced:

For President, to serve one year.

THOMAS CURTIS CLARKE, New York City.

For Vice-Presidents, to serve two years.

WILLIAM RICH HUTTON, New York City. Representing District No. 1.

PETER ALEXANDER PETERSON, Montreal, Canada. Representing District No. 2.

For Treasurer, to serve one year.

JOHN THOMSON, New York City. Representing District No. 1.

For Directors, to serve three years.

GEORGE ALEXANDER JUST, New York City. Representing District No. 1.

WILLIAM BARCLAY PARSONS, " " " " " 1

HORACE SEE, " " " " " 1.

JOHN RIPLEY FREEMAN, Boston, Mass. " " " 3.

DANIEL BONTECOU, Kansas City, Mo. " " " 6.

THOMAS WILLIAM SYMONS, Portland, Ore. " " " 6.

The following death was announced:

ORLANDO M. POE, Colonel Corps of Engineers and Brevet Brigadier-General, U. S. A. Elected Member January 8th, 1873; died October 2d, 1895.

E. C. Moore, Jun. Am. Soc. C. E., presented a paper on "Moving Two 36-In. Water Mains Without Shutting Off the Water," and it was discussed by Messrs. H. W. Brinckerhoff, Wegmann, Platt, Owen, and the author.

Howard Constable, M. Am. Soc. C. E., presented a number of photographs of the Ireland Building in New York City, which failed during construction, and an informal discussion of this disaster and of the New York building laws followed.

A vote of thanks to Mr. Constable was adopted.
Adjourned.

OCTOBER 16TH, 1895.—The Society met at 20 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 84 Members and 20 visitors.

A paper by Thomas C. Clarke, M. Am. Soc. C. E., entitled "Effect of Depth on Artificial Water-Ways," was read by the Secretary in the absence of the author, as were also written discussions by Messrs. W. J. Babcock, L. J. Le Conte, L. C. Sabin, Thomas T. Johnston and Richard Lamb. The paper was discussed further by Mr. E. P. North, who presented several specially prepared diagrams relating to the subject, and by Mr. Chauncey N. Dutton.

The Secretary announced the death of Pomeroy P. Dickinson, elected Member January 17th, 1872; died October 4th, 1895.

The Secretary announced that a plot (50 ft. front, 110 ft. deep) had been purchased for the new Society House, on the south side of Fifty-seventh Street, between Broadway and Seventh Avenue.

Adjourned.

OF THE BOARD OF DIRECTION.

(ABSTRACT.)

OCTOBER 1ST, 1895.—Ten Members present.

The matter of the proposed New Society House was considered and negotiations for the purchase of the lots Nos. 218 and 220 West Fifty-seventh Street were authorized, and it was further ordered that if these negotiations were successfully concluded, a circular should be issued to the membership asking for subscriptions.

Messrs. J. M. Knap, Charles C. Martin and John Thomson were appointed as Trustees to execute the preliminary contract for the purchase of the property.

Action was taken upon the communication of E. L. Corthell, M. Am. Soc. C. E., presented to the Society at the Annual Convention,

and by the Convention referred to the Board of Direction with the request that it give the matter careful consideration and action. The Secretary was instructed to present a report of the action taken to the Society and to Mr. Corthell.

Appointments were announced of the Board of Censors to award the Norman Medal and of the Committee to award the Rowland Prize for the current year.

The report of the Nominating Committee (in accordance with Art. VII, Section 2, of the Constitution) was received.

Applications were considered and other routine business transacted.

MEMOIR OF DECEASED MEMBER.

ARTHUR MELLEN WELLINGTON, M. Am. Soc. C. E.*

DIED MAY 16TH, 1895.

Arthur Mellen Wellington was born at Waltham, Mass., on December 20th, 1847. His father belonged to sturdy New England stock, and a great-grandfather was one of the little band of patriots that inaugurated the War of the Revolution at Lexington. Of Mr. Wellington's early life we know but little, save that he graduated from the Boston Latin School and at the age of sixteen years began the study of civil engineering in the office of Mr. John B. Henck, of Boston, the author of the once indispensable "Field Book for Engineers."

From 1863 to 1866, inclusive, he was an articulated student with Mr. Henck, and in addition to his civil engineering studies he advanced sufficiently in mechanical engineering to pass an examination for the position of an assistant engineer in the United States navy; but the Civil War was practically ended at the time and the appointment was never made. His first work on leaving the office of his Boston master was under Mr. Frederick Law Olmstead in the engineering corps of the Park Department of Brooklyn, when he served as leveler and as assistant engineer. In 1868 he first entered the railway field of engineering as a transitman upon the Blue Ridge Railroad in South Carolina. He was then an assistant engineer for nearly one year upon the Dutchess and Columbia Railroad in New York, and on leaving that road, in 1870, he was put in charge of a division on the Buffalo, New York and Philadelphia Railroad, being soon after promoted to the position of principal assistant engineer. He remained with this com-

* Memoir prepared by D. McN. Stauffer and Augustus Mordecai. Members Am. Soc. C. E.

pany for about two and one-half years and then became locating engineer of the Michigan Central Railroad, and later was engineer in charge of the Toledo, Canada Southern and Detroit Railroad.

The general cessation of railway building in the panic years of 1873-74 affected Mr. Wellington along with the majority of civil engineers in the United States at that time, and we find his restless energy first turned in the direction of literary work. In 1874 he published his "Computation of Earthwork from Diagrams," which was a presentation of methods devised by himself to expedite his own work on estimating upon railways, and the book was very favorably received by engineers. He contributed to the literature of engineering various shorter articles in the interval of 1874-78; but in 1875 he made a beginning upon his great work, "The Economic Theory of the Location of Railways." Commenced originally in the form of notes to guide him in a proposed location, he expanded it into a magazine article, and in 1876 he published it in the *Railroad Gazette* as a series of articles on "Justifiable Expenditure for Improving the Alignment of Railways." These articles were reprinted in book form in 1877, and the knowledge displayed and the original views presented at once attracted the attention of engineers and railway men to the young but talented author.

In 1878 Mr. Wellington became principal assistant engineer to Mr. Charles Latimer, chief engineer of what is now the New York, Pennsylvania and Ohio Railway, and in this position he spent three years. For want of more congenial work in actual location and construction he carried out an extended series of experiments on the resistance of rolling stock, through the courtesy of Charles Paine, Past President Am. Soc. C. E., and then general superintendent of the Lake Shore and Michigan Southern Railway. Mr. Wellington presented the results of these experiments to the Society on January 15th, 1879, his first contribution to the *Transactions*, which now contain several more of his able papers, beside the record of his valuable services upon committees and in the personal discussion of other papers and Society business.

In March, 1881, Mr. Wellington went to Mexico as engineer in charge of locations and surveys on the several lines of the Mexican National Railway. In this employment, so well suited to his personal taste and previous experience and study, he remained until 1884, serving later as assistant general manager and chief engineer in charge of location on the Mexican Central Railway under Rudolph Fink, M. Am. Soc. C. E.

In 1884 a new career was opened up to Mr. Wellington, one for which he was eminently fitted by reason of his ability, training and ready and forcible pen. It was that of technical journalism as one of the editors of the *Railroad Gazette*, and his personality was soon felt upon that journal. In connection with his editorial duties he edited

the revised editions of the "Car Builders' Dictionary," and he devoted every spare moment to the preparation of a second and much enlarged edition of his "Railway Location." In 1887 some changes were made in the ownership of the *Railroad Gazette*, and Mr. Wellington became part owner and one of the chief editors of *Engineering News*, and in that journal again the influence of his methods, energy and adaptation to journalistic work was soon apparent in every department. Almost simultaneously with his connection with *Engineering News* he published his "Economic Theory of the Location of Railways," a monumental work, upon which his fame as an able engineer, a forcible writer and an investigator of tireless industry can ever securely rest.

During the years following 1887, Mr. Wellington was engaged as a consulting engineer upon various public works. Among the more important of these were the elimination of grade crossings at Buffalo, N. Y., the improvement of railway terminals at Toronto and an examination of the foundations and structural defects of the Board of Trade building in the latter city. In 1888, at the request of President Van Horne, he made an extended investigation of the Canadian Pacific Railway system and testified later in the famous suit between that corporation and its contractors. He was a member of the Board of Engineers, which, in 1890, revised the estimates and reported upon the plans for the proposed Nicaragua Ship Canal; and in 1893 he was called before the Massachusetts Legislature to assist in defeating a proposed invasion of Boston Common by the West End Street Railway Company. Mr. Wellington suggested the Tremont Street subway as the best method of avoiding damage and carrying out the proposed improvement, a suggestion which was later adopted by the city authorities, and the subway itself is now actually under construction. His last work as a consulting engineer was in connection with the improvement of certain railway locations in the island of Jamaica, where he spent two months in the spring of 1893.

Personally, Mr. Wellington was a man of seemingly powerful physique, of earnest and positive convictions; tireless in his industry and sparing neither himself nor those about him when work was to be accomplished, and he always insisted upon good work. His personality was of the forcible type, always making itself felt wherever he was; but back of it all was the genial, just and loving man. The record he has left behind him sufficiently attests his worth as an engineer; original in methods and patient, energetic and far-seeing in his investigations into theory and practice. In fact, he was in advance of the practice of his fellow engineers when, in 1877, he first laid down the general laws governing the location of railways, laws which have since been almost everywhere accepted.

His inherent restless energy and love of work for the results obtainable may be said to have shortened a life that promised, through

his powerful physique, long years of further usefulness. With him new ideas were always awaiting development and furnishing food for his busy brain, and in 1892 these ideas took the form of a new type of thermodynamic engine, designed to convert heat into mechanical work with a smaller percentage of loss than in the best of existing engines. It should be added that he had expended his energy upon no visionary or merely erratic ideas upon an improvement in thermodynamic engines. His experiments were based upon deep study of his subject, and as he has provided for the carrying out of his project, those competent to judge say that we may yet expect important results from what undoubtedly shortened the life of an able man.

The development of this invention became an absorbing passion with him, and he expended much money and much more than a due share of the day and night upon his original and exhaustive experiments. In May, 1894, the physical man at last gave way under the strain put upon it, and Mr. Wellington was forced to seek rest in a voyage to Norway; but the relaxation came too late and his disease assumed an acute form. He returned home and passed months of alternate seeming recovery and sudden relapse, until finally it was decided that his only hope of life lay in submitting to an operation for the removal of a diseased kidney. This operation was performed successfully, but the disease had touched other organs and was complicated by a chronic weakness of the heart, and Mr. Wellington died on May 16th, 1895.

Mr. Wellington became a Member of the American Society of Civil Engineers on May 4th, 1881. He was also a member of the Institution of Civil Engineers, the American Society of Mechanical Engineers, the Canadian Society of Civil Engineers, and of the Engineers' Club of New York.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Election.	
BLAKELEY, GEORGE HENRY.....	Chief Engineer Pas-	{ J. Dec. 4, 1889 M. Oct. 2, 1895	
	saic Rolling Mill Co., Paterson, N. J.		
CAIRNS, ROBERT ANDREW.....	City Engineer, Waterbury, Conn.....	Oct. 2, 1895	
CHRISTIE, GEORGE B.....	512 New York Life Bldg., Chicago, Ill.....	Oct. 2, 1895	

DUGGAN, GEORGE HERRICK.....	Chief Engineer Dominion Bridge Co., Montreal, Canada	Oct.	2, 1895
FIEBEGER, GUSTAVE JOSEPH.....	Captain, Corps of Engineers, U. S. A., Washington, D. C.....	Oct.	2, 1895
GRAY, JOHN HENRY.....	517 New York Life Bldg., Chicago, Ill.....	Oct.	2, 1895
HODGE, HENRY WILSON.....	55 West 33d St., New York City.....	J. Jan.	5, 1887
LEWIS, NELSON P.....	Room 38, Municipal Dept. Bldg., Brooklyn, N. Y..	Oct.	2, 1895
LOWE, JESSE.....	512 New York Life Bldg., Chicago, Ill.....	Oct.	2, 1895
McCLINTOCK, J. Y.....	City Engineer, Rochester, N. Y.....	Oct.	2, 1895
MELLISS, DAVID ERNEST.....	524 Sacramento St., San Francisco, Cal.....	Oct.	2, 1895
MORTON, CHARLES.....	53 State St., Boston, Mass.	Oct.	2, 1895
NOSTRAND, PETER ELBERT.....	25 Palmetto St., Brooklyn, N. Y....	Assoc. M. M.	Sept. 7, 1892 March 6, 1895
SAWYER, EDWARD.....	60 Congress St., Boston, Mass.....	Oct.	2, 1895

ASSOCIATE MEMBERS.

BODY, JOHN BENJAMIN.....	Apartado 440, Mexico, Mexico.....	Oct.	2, 1895
BROWN, WENDELL PHILLIPS.....	The King Bridge Co., Cleveland, Ohio.....	Oct.	2, 1895
GUBELMAN, FREDERICK J.....	34 Ohio St., Room 12, Allegheny, Pa.....	Oct.	2, 1895
HARTS, WILLIAM WRIGHT.....	Lieut. Corps of Engineers, Newport, R. I.....	Oct.	2, 1895
HAZARD, ERSKINE.....	Choctaw, Oklahoma and Gulf R. R., South McAlester, Ind. T.....	Oct.	2, 1895
TAYLOR, THOMAS ULVAN.....	Austin, Tex....	Assoc. M.	Jan. 31, 1893
WADA, YOSHICHIKA.....	Railway Dept., Imperial Government, 39 Shimamura, Saigori, Gunbaken, Japan	Assoc. M.	Oct. 2, 1895
		J.	Sept. 7, 1887
		Assoc. M.	Oct. 2, 1895

WILLIAMS, GARDNER STEWART.....883 East Congress St.,
Detroit, Mich..... Oct. 2, 1895

ASSOCIATE.

ODELL, RUTLEDGE IRVING.....Tomkins Cove, N. Y..... Oct. 1, 1895

JUNIORS.

ALBERTSON, CHARLES.....Bangor, Pa..... Oct. 1, 1895
REICHMANN, ALBERT FERDINAND...1100 Old Colony Bldg.,
Chicago, Ill..... April 30, 1895
TODD, ALEXANDER MILLER.....U. S. Engineer Office,
Arkansas City, Ark..... Oct. 1, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

ASSERSON, P. C.....Civil Engineer U. S. N., U. S. Navy Yard,
Norfolk, Va.
BIXBY, WM. H.....Major Corps of Engineers U. S. A., P. O.
Bldg., Fourth Floor, Room 20, Philadel-
phia, Pa.
BRACKETT, DEXTER.....Engineer Distribution Dept., Metropolitan
Water Board, 3 Mt. Vernon St., Boston,
Mass.
BRETHAUP, WM. H.....71 Broadway, New York City.
DAVIS, FRANK P.....Port Simon, Costa Rica, C. A.
FAIRLEIGH, J. A.....271 Quincy St., Brooklyn, N. Y.
GRIMM, C. R.....244 Academy St., Trenton, N. J.
JENKINS, W. D.....Chief Engineer Aransas Pass Harbor Co.
and Aransas Harbor City and Imp. Co.,
Ropesville, Texas.
KINSLEY, T. P.....6 E. Lexington St., Baltimore, Md.
LEFFINGWELL, W. H.....Chief Engineer Midland Ter. Ry., P. O.
Box 602, Cripple Creek, Colo.
LINVILLE, J. H.....Lansdowne, Pa.
MARSTRAND, O. J.....63 Bleecker St., New York City.
MAXIM, H. S.....18 Queens Gate Place, Kensington, London,
England.
NELLES, GEORGE T.....U. S. Engineer Office, Chattanooga, Tenn.
NEWHAM, C. E.....572 East 159th St., New York City.
PEW, ARTHUR.....617½ Poplar St., Macon, Ga.
PRICE, W. G.....Sioux City, Iowa.
PRINCE, GEORGE T.....(Care Water Dept.), Atlantic City, N. J.
PURDON, C. D.....Principal Assistant Engineer A. T. and S.
F. R.R., Topeka, Kans.
RICE, GEORGE S.....22 William St., New York City.

RICHARDSON, T. F.....	Engineer Aqueduct Dept., Metropolitan Water Board, Clinton, Mass.
ROBINSON, JOHN J.....	Brooklyn Hills, Queens Co., N. Y.
ROSE, C. C.....	Assistant Superintendent Coal Dept., D. and H. Canal Co., Scranton, Pa.
ROSENZWEIG, A.....	Bucareli 1650, Mexico, Mexico.
RUSSELL, N. E.....	580 First Ave., Lansingburgh, N. Y.
STEARNS, F. P.....	Chief Engineer Metropolitan Water Board, 3 Mt. Vernon St., Boston, Mass.
SLOAN, R. I.....	Asbury Park, N. J.
THOMPSON, BENJ.....	Assistant Engineer Southern Ry., Greensboro', N. C.
VAN WINKLE, EDGAR B.....	115 East 70th St., New York City.
WARD, CHARLES D.....	702 St. Nicholas Ave., New York City.
WEISKOPF, S. C.....	Consulting Engineer, 44 Wall St., New York City.

ASSOCIATE MEMBERS.

DURYEA, EDWIN, Jr.....	392 Kent Ave, Brooklyn, N. Y.
GARRISON, F. L.....	921 Clinton St., Philadelphia, Pa.
McKEAN, R.....	Assistant Engineer St. L. and S. F. Ry., 7th and Cerre Sts., St. Louis, Mo.
MILLER, S. B.....	51 West 12th St., New York City.

ASSOCIATES.

CURRIER, C. G.....	313 West 102d St., New York City.
GOODELL, JOHN M.....	32 Macdonough St., Brooklyn, N. Y.
JACOBY, H. S.....	7 Reservoir Ave., Ithaca, N. Y.
WALKER, J. SHAW.....	"St. Stephens," Adelaide St., Woollahra, Sydney, N. S. W., Australia.
WARDER, J. H.....	23 Roslyn Place, Chicago, Ill.

JUNIORS.

ANDERSON, J. C.....	530 East 83d St., New York City.
BELL, G. J.....	(Care A. T. and S. F. R.R.), Thatcher, Colo.
BLODGETT, JOHN.....	Box 111, Steelton, Pa.
BORIGHT, W. P.....	Box 593, West Newton, Mass.
HURTIG, J. B.....	39 Cortlandt St., New York City.
KIBBE, AUG. S.....	Engineer of Construction Wm. Wharton, Jr. Co., Inc., Box 693, Chester, Pa.
KNOWLES, MORRIS.....	Assistant Engineer Metropolitan Water Board, 3 Mt. Vernon St., Boston, Mass.
MILLER, R. P.....	139 East 40th St., New York City.
REINHOLDT, K. O. P.....	15 Pearson Bldg., New Castle, Pa.
SWEITZER, N. B., Jr.....	Rockport, Texas.

TENNEY, GEORGE O	Spartanburg, S. C.
TUSKA, G. R.	Columbia College, 41 East 49th St., New York City.
VANDERLIP, H. E.	(Care J. Clarke & Sons Co.), 43 Sherman St., Chicago, Ill.
WADSWORTH, J. E.	East Berlin, Conn.

DEATHS.

DICKINSON, POMEROY P.	Elected Member January 17th, 1872; died October 4th, 1895.
PIKE, WILLIAM ABBOT	Elected Member, December 3d, 1890; died October 13th, 1895.
POE, ORLANDO M.	Elected Member January 8th, 1873; died October 2d, 1895.
POPE, WILLARD S.	Elected Member August 7th, 1872; died October 10th, 1895.

ADDITIONS TO

LIBRARY AND MUSEUM.

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| <p>From Board of Trustees of the Sanitary District of Chicago:
Proceedings, August 28th, September 5th, 11th, 18th.</p> <p>From Charles C. Brown, Indianapolis, Ind.:
Fourth Annual Report of the Board of Public Works of Indianapolis, Ind., for the year ending December 31st, 1894.</p> <p>From Citizens' Municipal Association, Philadelphia, Pa.:
Asphalt Paving, Reports of Experts.
Report concerning the Queen Lane Reservoir.</p> <p>From James Connolly, Albany, N. Y.:
First, Second, Third, Seventh and Eighth Annual Reports of the Factory Inspectors of the State of New York.</p> <p>From Cornell University, Ithaca, N. Y.:
Library Bulletin, June, 1895.</p> <p>From Department of Public Works, New York:
Annual Reports for 1892, 1893 and 1894, and Quarterly Report for Quarter ending March 31st, 1895.</p> <p>From Charles E. Fowler, Youngstown, Ohio:
General Specifications for Roofs and Iron Buildings.</p> <p>From Andrew H. Green, New York:
Eleventh Annual Report of the Commissioners of the State Reservation at Niagara for the fiscal year ended September 30th, 1894.</p> | <p>From J. E. Greiner, Baltimore, Md.:
Standard Specifications for Iron and Steel Bridges and Viaducts, 1894.</p> <p>From Herman Haupt, New York:
Long-Distance Transmission of Power.</p> <p>From Institution of Civil Engineers, London, Eng.:
Minutes of Proceedings, Vol. CXXII.
Charter, Supplemental Charter, By-Laws and List of Members, September 6th, 1895.</p> <p>From Institution of Mechanical Engineers, London, Eng.:
Proceedings, April, 1895.</p> <p>From Institution of Naval Architects, London, Eng.:
Transactions, Vol. XXXVI.</p> <p>From Iron and Steel Institute, London, Eng.:
The Journal of the Iron and Steel Institute, Vol. XLVII.
Rules and List of Members.</p> <p>From Mining Department, Melbourne, Australia:
Annual Report of the Secretary for Mines for the Year 1894.</p> <p>From Stuart Murray, Melbourne, Australia:
Victorian Water Supply, River Gaugings.</p> <p>From New York Central and Hudson River Railroad Co.:
Twenty-sixth Annual Report of the Board of Directors for the year ended June 30th, 1895.</p> |
|--|--|

- From Geo. W. Rafter, Rochester, N. Y.:
Report on Movable Bridges as Used in Europe.
- From Railroad Commissioners of Connecticut:
Report on Railroads for 1881, 1882, and 1888 to 1894 inclusive.
- From Railroad Commissioners of Iowa, Des Moines, Iowa:
Annual Reports 1890, 1891, 1892 and 1894.
Index to all Reports of the Board of Railroad Commissioners of Iowa, 1878 to 1894 inclusive.
Statutes of Iowa Relating to Railways.
Before the Board of Railroad Commissioners of Iowa in the Matter of the Application of the Illinois Central Railroad Company *et al.* for Advance in Freight Rates Decided January 12th, 1895.
- From Railroad and Warehouse Commission of Illinois:
Rules of Practice in all Cases and Proceedings before the Commission, together with the Statutory Provisions Governing Crossings and Interlocking Cases.
Annual Reports for 1881, 1885, 1886 1888, 1889, 1892 and 1894.
- From Royal Institute of Engineers, Hague, Holland;
Notulen der Vergaderingen, Vijfde Afdeling.
Verhandelingen, Vertalingen. Eerste Afdeling.
- From C. C. Schneider, Pencoyd, Pa.:
General Specifications for Railroad Bridges.
- From State Agricultural College, Fort Collins, Colo.:
Bulletins Nos. 31 and 32 of the Agricultural Experiment Station.
- From State Engineer and Surveyor, Albany, N. Y.:
Report on Movable Bridges as used in Europe.
- From William F. Stevens, New York:
Catalogue of the Library (supplement) of the Railroad Men's Building, Madison Avenue, New York.
- From George D. Snyder, Williamsport, Pa.:
Reports on Flood Protection for the City of Williamsport, Pa.
- From U. S. Department of the Interior:
Bulletins of the U. S. Geological Survey, Nos. 118, 119, 120, 121, 122.
Monograph No. XXIII. Geology of the Green Mountains in Massachusetts.
Monograph No. XXIV. Mollusca and Crustacea in the Miocene of New Jersey.
Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims.
- From U. S. Department of State:
Consular Reports, September, 1895.
- From U. S. Navy Department, Nautical Almanac Office:
The American Ephemeris and Nautical Almanac for the Year 1898.
- From U. S. Patent Office:
Alphabetical Lists of Patentees and Inventions for the Quarter ending March 31st, 1895.
Index to Vol. LXX Official Gazette.
- From U. S. Treasury Department, Bureau of Statistics:
Finance, Commerce and Immigration of the United States, August, 1895.
- From L. F. Vernon-Harcourt, London, Eng.:
Address to the Mechanical Science Section of the British Association for the Advancement of Science, on The Relation of Engineering to Science.
- From J. A. L. Waddell, Kansas City, Mo.:
General Specifications for Highway Bridges of Iron and Steel.
- From Geo. E. Waring, Jr., New York:
The Purification of Sewage by Forced Aeration.
- By Purchase:
Rechentafel nebst Sammlung häufig gebrauchter Zahlenwerthe. By Dr. H. Zimmermann.

BOOK NOTICE.

ENGINEERING CONTRACTS AND SPECIFICATIONS.

Including a Brief Synopsis of the Law of Contracts and Illustrative Examples of the General and Technical Clauses of Various Kinds of Engineering Specifications. By J. B. Johnson, M. Am. Soc. C. E., Professor of Civil Engineering, Washington University, etc. Cloth, 6 x 9 ins., pp. VII + 417. New York, Engineering News Publishing Company, 1895.

The author states in the preface to this work that he has tried to follow strictly the recognized authorities on the law of contracts in all he says in the book, and while he thinks his synopsis may serve as a good general guide to the fundamental principles of the subject, he recommends the reader to refer all important particular cases to his attorney, or else to consult the standard works themselves.

The contents of the book are divided as follows: Synopsis of the law of contracts, 66 pages; engineering specifications and accompanying documents, such as advertisements, instructions to bidders, and forms of proposals, 60 pages; specific, descriptive, or technical clauses in specifications, 144 pages; illustrative examples of complete contracts and specifications, 140 pages; appendix, containing instructions to assistant engineers on the Chicago, Milwaukee and St. Paul Railway concerning preliminary surveys and examinations for bridge renewals, 4 pages.

The illustrative examples of engineering specifications were selected to cover as wide a field with as little repetition as possible. The author does not give them for the purpose of being followed verbatim, but rather as illustrating good forms for the purposes intended that may be taken as patterns on which to construct others. These specifications have been drawn from many sources.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—November, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

NOVEMBER 6TH, 1895.—The Society met at 20.15 o'clock, President George S. Morison in the chair; Charles Warren Hunt, Secretary; and present, also, 87 Members and 13 visitors.

Minutes of the meetings of October 2d and 16th were adopted as printed in BULLETIN No. 66, dated October 30th, 1895.

The Secretary made the following announcements:

At a meeting of the Board of Direction, held last evening, by the unanimous vote of 26 members of the Board, which is the largest attendance ever had at a Board meeting, the purchase of the lots Nos. 218 and 220 West Fifty-seventh Street was authorized, and the preliminary action heretofore taken to secure this property for the purposes of the Society ratified. Authority to take all further steps necessary for the erection of the new Society House was also given.

A vacancy in the Board of Direction caused by the death, on October 10th, 1895, of Director Willard S. Pope, was filled November 5th, 1895, for the unexpired term for which Mr. Pope was elected, by the unanimous election of Alfred Noble, M. Am. Soc. C. E.

The following change in the method of issue of publications of the Society was adopted by the Board of Direction, November 5th, 1895, to take effect January 1st, 1896:

1. The *BULLETIN* to be discontinued.
2. Ten numbers of *Proceedings* to be issued during the year. These issues to be made promptly on the fourth Wednesday of each month, except June and July.
3. Each number of *Proceedings* to contain the minutes of the meetings of the month of issue, except that the number for August will contain the minutes of the first meeting in June and also of the Annual Convention.
4. The *Proceedings* will also contain the other matter now printed in *Proceedings* and *Bulletin*, except abstracts of papers.
5. Each number of *Proceedings* will contain in full, but without discussion (and in most cases without plates), the papers to be read and discussed at the second meeting of the following month, and the first meeting of the second month thereafter. Under this arrangement an advance copy of every paper will be in the hands of Members at least three weeks before its presentation for discussion. The May number will contain the papers to be presented at the Convention and possibly at the first September meeting.
6. The monthly issue of *Transactions* to be discontinued. The papers, with complete discussions, both oral and by correspondence, to be issued from time to time in volumes of about 600 pages, these volumes to be sent in paper covers. Arrangements will also be made for furnishing these volumes bound in cloth, half morocco, or other suitable binding, to Members or subscribers who desire them in that form and are willing to pay the small extra cost.
7. Under this arrangement and with the present amount of *Transactions* the Society will continue to issue twelve publications yearly, of which ten will be *Proceedings* and two will be volumes of *Transactions*.

The Secretary read an abstract of a paper on "The Discharge of the Mississippi River," by Wm. Starling, M. Am. Soc. C. E., and announced that three written discussions of this paper had been received.

On motion, duly seconded, it was resolved that the discussion on Mr. Starling's paper be postponed until the meeting of November 20th, and that the paper by Robert Brewster Stanton, M. Am. Soc. C. E., entitled, "Notes on the Construction of a Water System for Placer Mining, and Suggestions for a New Method of Dam Building," be taken up.

Mr. Stanton then presented his paper, and discussion followed by Messrs. T. C. Clarke, John Thomson, Bogart, Morison, North, Whinery,

P. W. Henry, L. L. Buck, A. McC. Parker, H. C. Meyer, Cartwright, R. L. Harris, and the author.

Announcement was made that the discussion on Mr. Starling's paper would be taken up at the meeting of November 20th, 1895, and that an opportunity for further discussion of Mr. Stanton's paper would be given at that meeting.

Ballots were canvassed, and the following candidates were declared elected:

AS MEMBERS.

WILLIAM WALLACE HAYDEN, Memphis, Tenn.
BENJAMIN McKEEN, Terre Haute, Ind.
JOHN MOULDER WILSON, Washington, D. C.
PAUL LUDWIG WÖLFEL, Pencoed, Pa.

AS ASSOCIATE MEMBERS.

SIFROY JOSEPH FORTIN, Brooklyn, N. Y.
ALBERT JAMES HIMES, Albany, N. Y.
ALBERT VICTOR KELLOGG, Houston, Tex.
THOMAS MCKENZIE, Gallipolis, Ohio.
JOHN CHARLES MILLS, Bombay, India.
CALEB MILLS SAVILLE, Malden, Mass.
GEORGE DUNCAN SNYDER, Williamsport, Pa.
JOSÉ RAMON VILLALON, New York City.

The Secretary announced the election by the Board of Direction November 5th, 1895, of the following candidates:

AS ASSOCIATE.

FRANK LESLIE FREEMAN, Washington, D. C.

AS JUNIORS.

WILLIAM HAYDEN FORD, Jersey City, N. J.
EDWARD WILLIAM LIBAIRE, Oceanic, N. J.
KINGSLEY LEVERICH MARTIN, Brooklyn, N. Y.
WALTER MORAY PEGRAM, Johnstown, Pa.
COLES ABEL RAYMOND, Toledo, Ohio.

Adjourned.

NOVEMBER 20TH, 1895.—The Society met at 20 o'clock, Treasurer John Thomson in the chair; Chas. Warren Hunt, Secretary, and present, also, 71 Members and 19 visitors.

A paper by William Starling, M. Am. Soc. C. E., entitled "The Discharge of the Mississippi River," which was read at the last meeting, was taken up, and written discussions by Messrs. Foster Crowell,

Charles H. Miller, Henry St. L. Coppée, W. G. Price, J. B. Johnson and Fred. P. Spalding were read by the Secretary, after which the subject was discussed orally by Mr. John Thomson. A paper by Robert Brewster Stanton, M. Am. Soc. C. E., entitled "Notes on the Construction of a Water System for Placer Mining, and Suggestions for a New Method of Dam Building," which was also read at the last meeting, was taken up and a written discussion by Mr. A. P. Davis was read by the Secretary.

Adjourned.

OF THE BOARD OF DIRECTION.

(ABSTRACT.)

NOVEMBER 5TH, 1895.—Twenty-six Members present.

Alfred Noble, M. Am. Soc. C. E., was elected Director to fill the vacancy caused by the death of Willard S. Pope, M. Am. Soc. C. E.

Action was taken authorizing the purchase of property in West Fifty-seventh Street, and the erection thereon of a new Society House.

A new method of the issue of the publications of the Society was adopted (see *Proceedings*, page 210).

Applications were considered and other routine business transacted.

One Associate and five Juniors were elected (see *Proceedings*, page 211).

Adjourned.

MEMOIR OF DECEASED MEMBER.

WILLIAM ABBOT PIKE, M. Am. Soc. C. E.*

DIED OCTOBER 13TH, 1895.

William Abbot Pike was born July 3d, 1851, in Dorchester, Mass., and graduated from the Massachusetts Institute of Technology in 1871. Immediately after graduation, he was called to the Chair of Engineering at the Maine State College, although he was at that time but twenty years of age. During the interval between his graduation

* Memoir prepared by J. T. Fanning, M. Am. Soc. C. E.

and the opening of college in August, he was in charge of surveys for the Back Bay improvements in Boston. At the Maine State College, he reorganized and modernized the Department of Engineering and brought it to a high standard of efficiency. This position he held for nine years, and then resigned, in 1880, to accept a similar position with the University of Minnesota in Minneapolis.

The University of Minnesota had, at that time, but the nucleus of a school of engineering, and its development and subsequent strong growth has been entirely under his charge and largely due to his efforts. In 1890, he was made Dean of the School of Engineering and later he was given the Directorship of the School of Mechanic Arts. He remained with the University until June, 1892, when, owing to ill health and a desire to establish a private engineering practice, he resigned, but was induced to devote a part of his time to the University as a lecturer on mechanical engineering.

While directing the School of Mechanic Arts, he found time to carry on some outside engineering practice, and, among other engagements, he designed the Northern Pacific Railroad coal docks at Superior, Wis., and the water-works system at St. Cloud, Minn. He also made tests of mechanical plants in the northwest, notably the St. Paul and Minneapolis plants of the Twin City Rapid Transit Company and the Schichau engine exhibited at the World's Fair, after its installation by the Washburn-Crosby Company in their flouring mills in Minneapolis. He also acted as chief or consulting engineer for the North Star Iron-Works, the Cooper-Hampton Company and the Board of Court House and City Hall Commissioners in Minneapolis.

Professor Pike was a charter member of the Engineers' Club of Minneapolis and one of its most enthusiastic founders and members. He was its first secretary and held the office from its organization, in May, 1883, to January, 1886. In February, 1888, he was elected its president, in which office he was continued four years. At the time of his death he was the club's representative on the Board of Management of the Association of Engineering Societies.

Possessing great acumen and soundness of judgment, Professor Pike had a faculty of understanding a student's needs which gave him his remarkable success as an instructor. For the last years of his life he was seriously handicapped by ill health and insomnia, by which his strength of constitution was so impaired that he fell an easy victim to pneumonia, from which he died after but three days' sickness.

He became a Member of the American Society of Civil Engineers December 3d, 1890, and was also a member of the American Society of Mechanical Engineers. He leaves a widow and two sons.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.
ADAMS, ARTHUR LINCOLN.....	Astoria, Ore.....	Oct. 2, 1895
BROWN, CHARLES CARROLL.....	Consulting Engineer, 134 East Tenth St., Indianapolis, Ind.	Oct. 2, 1895
SPICER, VIBE KIERULFF	1534 Monadnock Bldg., Chi- cago, Ill.....	June 5, 1895
WILSON, JOHN MOULDER.....	Colonel Corps of Engineers, U. S. A., Room 24, War De- partment, Washington, D. C.....	Nov. 6, 1895
WÖLFEL, PAUL LUDWIG	Pencoyd Iron { J. Works, Pencoyd, { Assoc. M. Pa..... M.	July 3, 1889 July 1, 1891 Nov. 6, 1895

ASSOCIATE MEMBERS.

CLARK, JOSEPH HENRY.....	93 Columbia Place, Chicago, Ill.....	Sept. 4, 1895
HIMES, ALBERT JAMES.....	268 Hamilton St., Albany, N. Y.....	Nov. 6, 1895
MCKENZIE, THOMAS.....	174 Weybosset St., { J. Providence, R.I. { Assoc. M.	May 2, 1893 Nov. 6, 1895
RICKER, GEORGE ALFRED.....	1200 D. S. Morgan Bldg., Buffalo, { J. N. Y..... { Assoc. M.	April 7, 1889 May 1, 1895
SNYDER, GEORGE DUNCAN.....	City Engineer, City Hall, Williamsport, Pa.....	Nov. 6, 1895

ASSOCIATE.

FREEMAN, FRANK LESLIE	931 F St., Washington, D. C..	Nov. 5, 1895
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JUNIORS.

FORD, WILLIAM HAYDEN.....	31 Reservoir Ave., Jersey City, N. J.....	Nov. 5, 1895
LIBAIRE, EDWARD WILLIAM. ...	150 West 49th St., New York City.....	Nov. 5, 1895
MAGOR, HENRY BASIL	105 West 71st St., New York City.....	April 30, 1895
MARTIN, KINGSLEY LEVERICH..	194 Berkeley Place, Brooklyn, N. Y	Nov. 5, 1895
PHILLIPS, FRED CLINTON.	613 Monroe St., Little Falls, N. Y.....	June 4, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

- BALDWIN, H. F.....Engineer Maintenance of Way, N. Y., L. E.
and W. R. R., Erie Depot, Jersey City, N. J.
- BRIGGS, R. E.....Chief Engineer Mexico, Cuernavaca and
Pacific Ry., Mexico, Mexico.
- CARSON, H. A.....20 Beacon St., Boston, Mass.
- DOEBLER, V. S.....Supervisor No. 4 Philadelphia Division P. R.
R., Middletown, Pa.
- ELLIOTT, C. G.....114 Broadway, Peoria, Ill.
- FOLLETT, W. W.....233 E. Maple St., Denver, Colo.
- GRANT, E. W.....Carrollton, Mo.
- HAINES, H. S.....417 Equitable Building, Atlanta, Ga.
- HAZLEHURST, GEORGE B.....1215 N. Charles St., Baltimore, Md.
- HUDSON, JOHN R.....543 Van Buren St., Chicago, Ill.
- LOVETT, THOMAS D.....12 East Third St., Cincinnati, Ohio.
- MACNAUGHTON, JAMES.....370 State St., Albany, N. Y.
- PRICE, W. G.....U. S. Engineer's Office, Custom House, Cin-
cinnati, Ohio.
- RISER, K. S.....Penn Bridge Co., Beaver Falls, Pa.
- SAVAGE, A. C.....Constructing Engineer Trenton Iron Co.,
Trenton, N. J. (Residence, 493 Ninth St.,
Brooklyn, N. Y.)
- SELLERS, COLEMAN.....537 Philadelphia Bourse, Philadelphia, Pa.
- SPENCER, SAMUEL.....80 Broadway, New York City.
- TOMPKINS, J. A. B.....U. S. Engineer's Office, 366 Milwaukee St.,
Milwaukee, Wis.
- WASHBURN, FRANK S.....5 West 39th St., New York City.

ASSOCIATE MEMBERS.

- FOWLER, CHARLES E.....521 Holmes St., Youngstown, Ohio.
- HAZARD, ERSKINE.....Mauch Chunk, Pa.
- HOWARD, C. P.....Chief Engineer's Office, O. S. R. R., Lima,
Ohio.
- LUCAS, E. W. VAN C.....Lieutenant Corps of Engineers, U. S. A.,
Willetts Point, N. Y.
- ROBINSON, H. D.....126 West 91st St., New York City.
- STOUT, E. C.....201 West 118th St., New York City.

ASSOCIATE.

- JOHNSTON, J. P.....1014 Carnegie Bldg., Pittsburg, Pa.

JUNIORS.

- BAEHR, W. A.....272 Ninth St., Milwaukee, Wis.
- EDES, WILLIAM C.....321 Market St., San Francisco, Cal.
- EVANS, P. P.....160 Kenilworth St., Cleveland, Ohio.
- LUDWIG, ALFRED.....166 Huron St., Cleveland, Ohio.
- STICKNEY, G. F.....U. S. Assistant Engineer, Bowling Green, Ky.
- WALLS, W. S.....Hamilton Bridge Co., Hamilton, Canada.

ADDITIONS TO LIBRARY AND MUSEUM.

- From American Society of Mechanical Engineers:
Catalogue of Officers, Members and Rules.
July 1st, 1895.
- From Board of Trustees of the Sanitary District of Chicago:
Proceedings, September 25th and October 2d and 9th, October 16th, 23d and 30th.
- From California State Mining Bureau, San Francisco, Cal.:
California Gold Mill Practices.
- From Citizens' Municipal Association of Philadelphia:
Ninth Annual Report with List of Members, Officers and Committees, 1895.
- From T. C. Clarke, New York:
Splinter from Cedar of British Columbia which has been exposed to the weather for 200 years.
- From College of Engineers and Architects, Palermo, Sicily:
Proceedings, May to December, 1894.
- From Cornell University, Ithaca, N. Y.:
Bulletins Nos. 99 and 100 of the Agricultural Experiment Station.
- From E. L. Corthell, North Egremont, Mass.:
The Isthmian Ship Railway.
Tonnage for the American Trans-Isthmian Route at Tehuantepec.
Concession from the Government of Mexico to James B. Eads and his associates.
Statement by the Atlantic and Pacific Ship Railway Company, June, 1888.
An Exposition of the Errors and Fallacies in Rear-Admiral Ammen's Pamphlet entitled "The Certainty of the Nicaragua Canal Contrasted with the Uncertainties of the Eads Ship Railway."
The Atlantic and Pacific Ship Railway across the Isthmus of Tehuantepec in Mexico.
The Interoceanic Problem and its Scientific Solution.
- From Engineering News, New York:
Engineering Contracts and Specifications by J. B. Johnson.
- From L. M. Haupt, Philadelphia, Pa.:
Sectionalism and Railways vs. Deep Waterways.
- From Clemens Herschel, N. Y.:
Measuring Water.
- From Edwin A. Hill, New Haven, Conn.:
Some Additional Notes on Argon and Helium.
- From M. L. Holman, St. Louis, Mo.:
Annual Report of the Water Commissioner of St. Louis for the fiscal Year ending April, 1894.
- From Charles D. Jameson, Iowa City, Iowa:
Portland Cement.
- From J. de Bruyn Kops, Savannah, Ga.:
Report on Out-Fall Sewer for Savannah, Ga.
- From New South Wales Government Board for International Exchanges:
Report of the Executive Commissioner for New South Wales to the World's Columbian Exposition, Chicago, 1893.
- From North East Coast Institution of Engineers and Ship Builders, Newcastle, England:
Transactions, Vol. XI, 1894-95.
- From North of England Institute of Mining and Mechanical Engineers, Newcastle, England:
Annual Report of the Council for 1894-95.
List of Council, Officers and Members for 1895-96.
- From Railway Commissioners of New South Wales, Sydney, N. S. W.:
Annual Report for the Year ending 30th June, 1895.
- From State Board of Health of Iowa:
Iowa Health Bulletin, October, 1895.
- From State Engineer of Colorado, Denver, Colo.:
Report of the State Engineer for 1893 and 1894.
Seventh Biennial Report for 1893 and 1894.
Irrigation Laws and Instructions to Superintendent and Water Commissioners of Colorado.
- From D. Van Nostrand Company, N. Y.:
Lettering of Working Drawings.
- From U. S. Coast and Geodetic Survey:
Report of the Superintendent for the fiscal Year ending June 30th, 1893.
- From U. S. Department of the Interior:
Manufacturing Industries of the United States at the Eleventh Census, Part III.
Report on Transportation Business in the United States at the Eleventh Census, 1890.
- From U. S. Department of State:
Consular Reports, October, 1895.
- From University of Wisconsin, Madison, Wis.:
Bulletin, Vol. I, No. 6, Railway Signaling.

American Society of Civil Engineers.

PROCEEDINGS.

Vol. XXI.—December, 1895.

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MINUTES OF MEETINGS.

OF THE SOCIETY.

DECEMBER 4TH, 1895.—The Society met at 20.15 o'clock, T. C. Clarke, M. Am. Soc. C. E., in the chair; Charles Warren Hunt, Secretary, and present, also, 80 Members and 17 visitors.

Minutes of the meetings of November 6th and 20th, 1895, were adopted as printed in *Proceedings* for November, 1895.

The Secretary announced the deaths of the following members :

HORACE LAFAYETTE EATON, elected Member February 1st, 1893; died November 23d, 1895.

CHARLES WOOD, elected Associate Member July 4th, 1894; died November 28th, 1895.

Announcement was also made of the appointment by the Board of Direction of Messrs. Alfred W. Trotter, S. L. F. Deyo and the Secretary, as a committee to take charge of the arrangements for the Annual Meeting.

A paper entitled "Tests of Fire-Proof Flooring Material" was presented by George Hill, Assoc. M. Am. Soc. C. E., and was illustrated by stereopticon views of arches undergoing tests or broken under known conditions of loading. Messrs. Howard Constable, Robert W. Lesley, Calvin Tomkins, T. C. Clarke, John F. O'Rourke, George A. Just, Oscar Lowinson, and the author discussed the paper orally, and the Secretary read communications on the subject from Messrs. M. J. Butler and J. R. Worcester.

Ballots were canvassed, and the following candidates were declared elected :

AS MEMBERS.

CHARLES HENRY DAVIS, New York City.
EMILIO DEL MONTE, Havana, Cuba.
ROBERT CAMPBELL GEMMELL, Salt Lake City, Utah.
RICHARD JUSTIN McCARTY, Kansas City, Mo.
WILLIAM ARTHUR PRATT, Philadelphia, Pa.
THOMAS KENNARD THOMSON, Stamford, Conn.

AS ASSOCIATE MEMBERS.

GEORGE THOMPSON DE FOREST, De Freestville, N. Y.
JOHN FLETCHER FAIRCHILD, Mt. Vernon, N. Y.
IRVING MASON WOLVERTON, Columbus, O.

The Secretary announced the election by the Board of Direction on December 3d, 1895, of the following candidates :

AS JUNIORS.

JOSHUA BINION, New York City.
LEON SALOMON MOISSEIFF, New York City.

Adjourned.

NOVEMBER 20TH, 1895.—The Society met at 20.20 o'clock, Edward P. North, M. Am. Soc. C. E., in the chair; Charles Warren Hunt, Secretary, and present, also, 82 Members and 14 visitors.

Thomas Egleston, M. Am. Soc. C. E., chairman of a committee of the American Metrological Society on "An International Metric Gauge," delivered an address on the subject of standard gauges, giving a historical review of American gauges and an outline of the present status of the movement for an international metric gauge.

An address on the subject of asphalt and asphaltic reservoir linings was delivered by Rudolph Hering, M. Am. Soc. C. E., as a discussion on the paper by Robert B. Stanton, M. Am. Soc. C. E., entitled

"Notes on the Construction of a Water System for Placer Mining, and Suggestions for a New Method of Dam Building," presented at the meeting of November 6th, 1895. Mr. Hering's address was illustrated by stereopticon views, photographs, and samples of asphalt and asphaltic preparations. The subject was discussed by Messrs. J. C. Platt, H. D. Bush, Charles Warren Hunt, L. L. Buck, Herbert Steward and E. P. North, and correspondence was read from Messrs. J. W. Smith, D. D. Clarke and R. A. Cummings. An address on the Queen Lane pumping station and reservoir of the Philadelphia Water-Works was given by John C. Trautwine, Jr., Assoc. Am. Soc. C. E., which was illustrated by stereopticon views and samples of asphaltic reservoir linings. Mr. Trautwine's address was in part a discussion of Mr. Stanton's paper.

The Secretary announced the death of W. HOWARD WHITE, a former Director of the Society; elected Member March 5th, 1873; died December 11th, 1895.

The Secretary announced that by vote of the Board of Direction no paper would be presented at the meeting of January 1st, 1896, and that a special meeting would be held on Wednesday, January 8th, 1896, for the presentation and discussion of papers.

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract.)

DECEMBER 3D, 1895.—Six members present.

Messrs. Alfred W. Trotter, S. L. F. Deyo and Chas. Warren Hunt were appointed a committee to take charge of the arrangements for the Annual Meeting.

It was ordered that no paper should be set down for presentation at the meeting of January 1st, 1896, and that a Special Meeting should be held on Wednesday, January 8th, 1896, for the presentation of papers and discussion.

The employment of an expert accountant to examine the accounts and books of the Society and to report to the Board was authorized.

Applications were considered and other routine business transacted.

Adjourned.

LIST OF MEMBERS.

ADDITIONS.

MEMBERS.		Date of Membership.
CHAMBERLAIN, PHILLIP WILLIAM...	Obero Camp, Iztapa R. R., Guatemala, Central America.....	Oct. 2, 1895
HAYDEN, WILLIAM WALLACE.....	Assistant Engineer Y. & M. V. R. R., Memphis, Tenn.....	Nov. 6, 1895
McKEEN, BENJAMIN.....	Division Superintendent T. H. & I. R. R., Terre Haute, Ind.	Nov. 6, 1895
PRATT, WILLIAM ARTHUR	Engineer of Bridges, P. R. R., Broad St. Station, Philadelphia, Pa.....	Dec. 4, 1895
THOMSON, THOMAS KENNARD.....	321 E. Main St., { J. Oct. 3, 1888 Stamford, { Assoc. M. June 3, 1891 Conn. { M. Dec. 4, 1895	

ASSOCIATE MEMBERS.

DE FOREST, GEORGE THOMPSON....	De Freestville, N. Y.....	Dec. 4, 1895
FAIRCHILD, JOHN FLETCHER.....	Rooms 10 and { J. April 5, 1892 11, Bank { Assoc. M. Dec. 4, 1895 Bldg., Mt. { Vernon, N. Y. {	
KELLOGG, ALBERT VICTOR.....	H. & T. C. R. R., Houston, Texas.....	Nov. 6, 1895
LUDWIG, JULIUS ALFRED	166 Huron St., { J. May 31, 1892 Cleveland, O. { Assoc. M. Oct. 2, 1895	

JUNIORS.

ANDREWS, MORTON CLARKE	Williamsport, Ind.....	Oct. 1, 1895
BURNS, JAMES FERGUSON	Assistant Engineer L. & N. R. R., Evansville, Ind....	Oct. 1, 1895
PEGRAM, WALTER MORAY.....	The Johnson Co., Johnstown, Pa.	Nov. 5, 1895
RAYMOND, COLES ABEL	2102 North 14th St., Toledo, Ohio.	Nov. 5, 1895

CHANGES AND CORRECTIONS.

MEMBERS.

BISSELL, F. E.	Hotel Albert, Denver, Colo.
BROWN, CHARLES C.	19½ Pennsylvania St., Indianapolis, Ind.
ELWELL, C. C.	Superintendent New England R. R., Norwich, Conn.
GILES, ROBERT	Union Bridge Co., Athens, Pa.
HALL, WILLIAM M.	Assistant Engineer, Corps of Engineers, U. S. A., U. S. Engineer Office, Cincinnati, Ohio.
JACKSON, J. M.	Summit, Ill.
JEWETT, WILLIAM C.	191 Denison Ave., Cleveland, Ohio.
JOHNSTON, A. L.	1112 E. Main St., Richmond, Va.
LANDRETH, WILLIAM B.	Brunswick, Ga.
McKENZIE, THEODORE H.	38 Ballerstein Bldg., Hartford, Conn.
MILLER, SILVANUS	Puerto Barrios, Guatemala, Central America.
MORRIS, GOUVERNEUR	Wayne Hotel, Detroit, Mich.
PEARSONS, G. W.	City Hall, Kansas City, Mo.
PETRY, ALFRED	507 Upper 1st St., Evansville, Ind.
QUINTUS, J. C.	U. S. Assistant Engineer, 1101 Morgan Bldg., Buffalo, N. Y.
RAYMOND, CHARLES WARD	Grand Victory Gold Mining Co., Placerville, Cal.
RIVES, A. L.	Cobham, Va.
ROSECRANS, W. S.	P. O. Box 303, Los Angeles, Cal.
SCHUYLER, JAMES D.	415 West Washington St., Los Angeles, Cal.
SHIRREFFS, REUBEN	3 Mt. Vernon St., Boston, Mass.
SYMONS, T. W.	Captain Corps of Engineers, U. S. A., 1101 Morgan Bldg., Buffalo, N. Y.
TAUSSIG, H. P.	1102 Union Trust Bldg., St. Louis, Mo.
TOMPSON, G. M.	98 Prospect St., Wakefield, Mass.
WENTWORTH, C. C.	Chief Engineer Virginia Bridge and Iron Co., Roanoke, Va.
YEATMAN, C. P.	Barranquilla, U. S. Colombia,

ASSOCIATE MEMBERS.

ALDEN, HERBERT CLARENDON	Assistant Engineer Aqueduct Commission, Jerome Park Reservoir, Kingsbridge, New York City.
DAVIS, A. P.	Florence, Ariz.
DAVIS, CHANDLER	30 East 39th St., New York City.
ENGSTRÖM, FRANS	Assistant Engineer Dept. Public Works, Highland Park, Pittsburgh, Pa.

FREEMAN, E. G.	Resident Engineer, New East River Bridge, 392 Kent Ave., Brooklyn, N. Y.
HARTS, WILLIAM W.	Lieut. Corps Engineers, U. S. A., Custom House, Frankfort, Ky.
HEMMING, D. W.	Norton and Dalton, 1476 Third Ave., New York City.
MATHEWSON, I.	Box 178, Muscatine, Iowa.
VEDELER, G. H.	130 East 127th St., New York City.

ASSOCIATES.

KARNER, W. J.	General Manager St. Louis, Belleville and Southern Ry., 212 Security Bldg., St. Louis, Mo.
PHILLIPS, H. A.	120 Tremont St., Room 503, Boston, Mass.

JUNIORS.

COLBY, S. K.	Pittsburg Reduction Company, Havemeyer Bldg., New York City.
MONCURE, W. A.	Const. Dept. P. R. R., Mt. Joy, Pa.
MONSARRAT, N. D.	(Care N. Monsarrat, Pres. C. S. & H. Ry.), Columbus, Ohio.
NOSTRAND, GEORGE E.	165th St., West of Amsterdam Ave., New York City.
SEITZINGER, W. W.	711 North 5th St., Reading, Pa.
SMYTH, A. M.	824 Lexington Ave., New York City.
TABER, GEORGE A.	67 Irving Place, New York City.
TAINTOR, WILLIAM N.	25 East 46th St., New York City.

FELLOW.

BARBER, A. L.	66 Broadway, New York City.
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DEATHS.

EATON, HORACE LAFAYETTE	Elected Member February 1, 1893; died November 23d, 1895.
WOOD, CHARLES	Elected Associate Member July 4, 1894; died November 28th, 1895.

ADDITIONS TO LIBRARY AND MUSEUM.

From American Institute of Mining Engineers:

- Assay of Auriferous Ores and Gravels by Amalgamation.
 - A Section of Rich Patch Mountain at Iron Gate, Va.
 - An Improved Form of Protractor for Mapping Mine Surveys.
 - Biographical Notice of Eckley B. Coxe.
 - Biographical Notice of Franz Posepny.
 - Chrome in the Southern Appalachian Region.
 - Discussion on the Tin Deposits of Durango; on the Nomenclature of Zinc Ores; on a Southern Coal-Washing Plant.
 - Notes on Certain Water-Worn Vein Specimens.
 - Notes on the Magnetization and Concentration of Iron Ore.
 - Proceedings of the Sixty-ninth Meeting, Atlanta, Ga., October, 1895.
 - Southern Magnetites and Magnetic Separation.
 - The Eastern Coal Region of Kentucky.
 - The Florida Pebble Phosphates.
 - The Geological Structure of the Western Part of the Vermilion Range, Minnesota.
 - The Gold Regions of Georgia and Alabama.
 - The Magnetic Separation of Iron Ore.
 - The Present Condition of Gold Mining in the Southern Appalachian States.
- From Board of Trustees of the Sanitary District of Chicago:
- Proceedings November 6th, 13th, 20th and 27th, December 3d and 4th, 1895.
- From Boston Public Library, Boston, Mass.:
- Bulletin July, October, 1895.
- From Boston Transit Commission:
- First Annual Report for the year ending August 15th, 1895.
- From George Earl Church, London, Eng.:
- Report upon the Costa Rica Railway, October 28th, 1895.
- From Cincinnati Public Library:
- Annual Reports of the Librarian and Treasurer for the year ending July 1st, 1895.
- From Hermann Costenoble, Jena, Germany:
- Anleitung zur Ausführung graphischer Konstruktionen im Maschinenbau.
- From Mrs. T. Haskins Du Puy:
- Album of Designs of the Phoenix Bridge Co.
 - Annual Report of the Secretary of Internal Affairs of Pennsylvania. Parts 1 and 4, 1885.
 - Annual Report of the State Engineer and Surveyor of New York on the Railroads for the year ending September 30th, 1882. (2 copies.)
 - Annual Report of the State Engineer and Surveyor of New York on the Canals. Submitted January 27th, 1882.

Annual Report of the Forest Commission of the State of New York for the year 1885.

- Annual Report of the Superintendent of Public Works of New York for the year ending September 30th, 1881.
- Annual Report upon the Improvement of Rivers and Harbors on the Coast of South Carolina, 1880.
- Acts and Resolutions of the General Assembly of the State of Georgia, passed at the regular Session of January, 1876.
- Fortieth Annual Report of the Pennsylvania R. R. Co., March 8th, 1887.
- Guide to the Northern Pacific Railroad and its Branches.
- Illustrated Catalogue of Baldwin Locomotive Works.
- Illustrated Catalogue of Tiden Nordenfelt & Co. Sections of Rails, etc.
- Marquette, Sault Ste. Marie and Mackinaw R. R. Walter vs. Barnes *et al.*
- Milwaukee Car Axle Co.
- Mobile and Ohio Railroad Co.—A Compendium of the Several Deeds of Mortgage and Trust made by said Company.
- Mobile and Ohio Railroad Co.—New Issues under the Agreement for the Readjustment of Securities.
- Mobile and Ohio Railroad Co.—Wm. Butler Duncan *et al.* vs. The Mobile and Ohio Railroad Co.
- Map of the Northern Pacific Railroad and its Branches.
- Map of Nova Scotia.
- Map of Transportation Lines between the United States and Mexico.
- Map of the Railroads of the State of New York to accompany Report of the State Engineer and Surveyor, 1882.
- Map Showing the Railroads within a radius of 40 miles from the State Capitol in the City of Albany, 1883 (3 copies).
- Map showing the route of the Continental Railway and its connecting lines (2 copies).
- Maps accompanying Report on Forest Trees of North America.
- Maps (26) of various Battle Fields of the War of the Rebellion.
- Map of the United States, 1883.
- Competitive Designs for the Hawkesbury River Bridge, New South Wales.
- Aqueduct Bridge across the Potomac River at Georgetown, D. C.
- Observations concerning Eastern and Western Railway Transport over the Atlantic and Great Western Railway.
- Postal Telegraph and Cable Company.
- Prospectus of a New Trunk Line to the West.
- Report on the Channel Tunnel.
- Report of New York State Survey on the Preservation of the Scenery of Niagara.
- Report of the Condition of the Atlantic and Great Western Railroad.
- Report of the Chief of Engineers relating to the Construction of a Ship Canal across the Peninsula of Florida.

- Resources of South-West Virginia.
Senate Documents, First Session, 48th Congress, 1884.
Statistical Atlas of the United States, Part 3, 1874.
Survey of the Northern Boundary of the United States from the Lake of the Woods to the Summit of the Rocky Mountains, 1878.
Tenth Census of the United States, 1870; Population and Social Statistics; Vital Statistics and Industry, and Wealth (4 volumes).
The Adirondack Railway Company: Articles of Association (2 copies).
The Adirondack Railway Company: Its Railroad and Estate (2 copies).
The Adirondack Railway Company: Its Present Condition, 1883.
The Adirondack Railway Company and its Real Estate, 1885 (2 copies).
The Adirondack Railway Company: Letter from T. Haskins DuPuy, 1883.
The Adirondack Railway Company: Condensed Memorandum (8 copies).
The Philadelphia and Erie Railroad Company vs. Catawissa Railroad.
The Philadelphia and Erie Railroad Company vs. Catawissa Railroad, Authorities, Acts, etc.
Western Incidents connected with the Union Pacific Railroad.
Map of Arizona.
Map of Denver and Rio Grande Railroad System.
Map of Louisiana.
Map of Northern New York showing the route of the Adirondack Railway.
Map of Newport News and Mississippi Valley Company's System of Railway Lines.
From Field Columbian Museum, Chicago, Ill.:
Annual Report of the Director to the Board of Trustees for the Year 1894-95.
From Imperial University of Japan, Tokyo, Japan:
The Imperial University Calendar, 1894-95.
From Institution of Civil Engineers, London, England:
Minutes of Proceedings, Subject Index, Vol. LIX to CXVIII.
From Institution of Engineers and Shipbuilders in Scotland, Glasgow, Scotland:
Transactions, Vol. XXXVIII, 1894-95.
From G. H. Knibbs, Sydney, N. S. W.:
The History, Theory and Determination of the Viscosity of Water by the Efflux Method.
From Daniel W. Mead, Rockford, Ill.:
The DeKalb Electrical Pumping Plant.
From Mining Institute of Scotland, Hamilton, Scotland:
Transactions, General Meeting, June 13th, 1895.
List of Members, 1894-95.
Rules as revised at the Special Meeting, October 9th, 1895.
From New York Car Wheel Works, Buffalo, N. Y.:
Record of Tests on Special Quality Chilled Iron Wheels.
From Nova Scotia Institute of Science, Halifax, N. S.:
Proceedings and Transactions, Session of 1893-94.
From Edward P. North, New York:
Proceedings of the First Annual Convention of the International Deep Waterways Association.
From Royal Society of New South Wales, Sydney, N. S. W.:
Journal and Proceedings for 1894, Vol. XXVIII.
From Clinton B. Sears, Duluth, Mich.:
Blue Print and 12 Photographic Views relating to the Concrete Superstructure for the Breakwater at Marquette, Mich.
From Edward Smith & Co., New York:
Application of Paints, Varnishes and Enamels for the Protection of Iron and Steel Structures and Hydraulic Work.
From State Board of Health of Massachusetts:
Twenty-sixth Annual Report for the year ending September 30th, 1894.
From State University of Iowa, Iowa City, Ia.
Catalogue for 1894-95 and Announcement for 1895-96.
From U. S. Department of the Interior:
Annual Report of the Commissioner of Patents for the year 1894.
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